AMERICAN AGRICULTURIST

FOR THE

Farm, Garden, and Household.

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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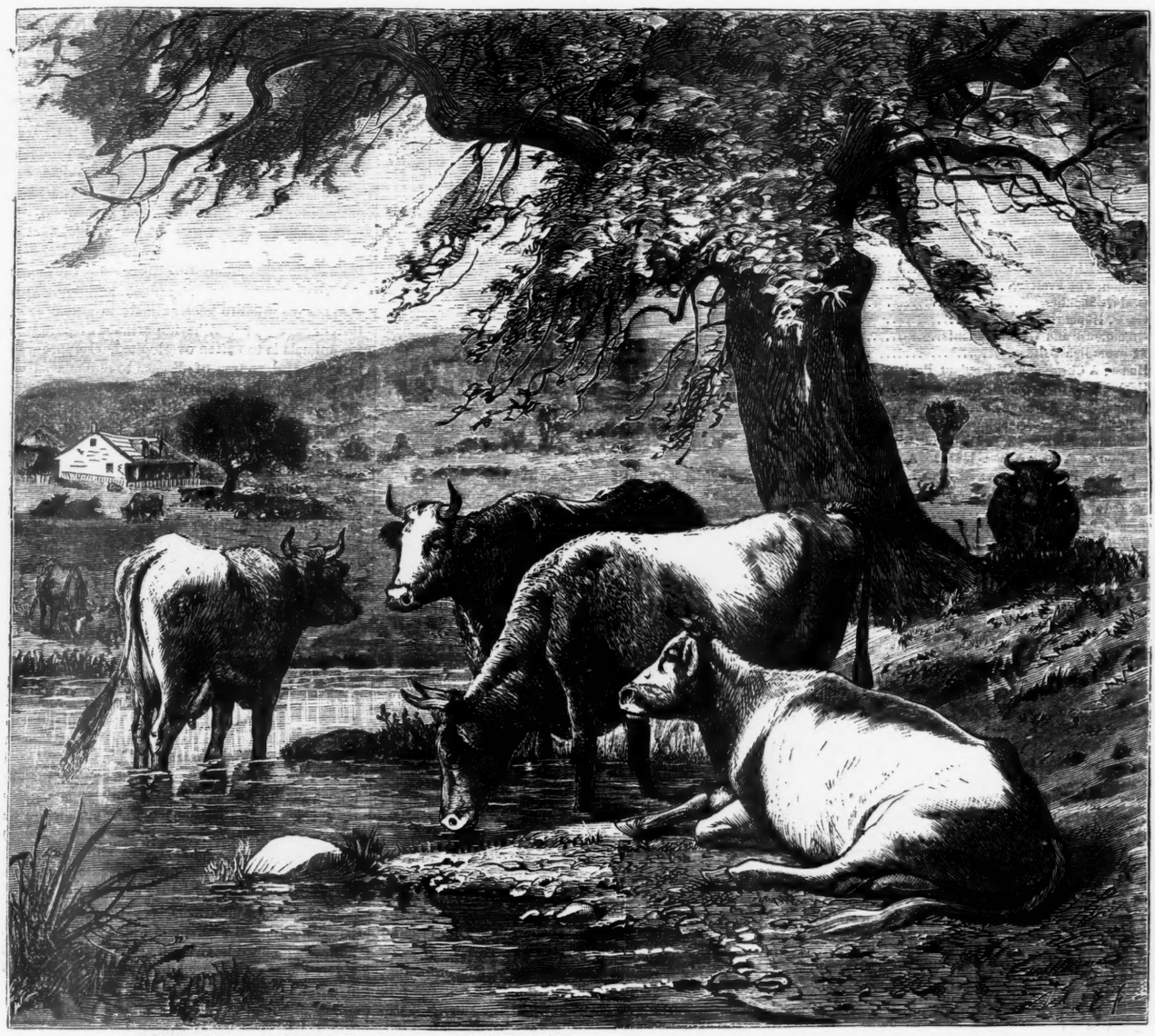

A COOL, SHADY COW PASTURE.— *Drawn and Engraved Expressly for the American Agriculturist.*

There is an impression possessing the minds of many farmers that there is only one profitable place for a forest tree, and that is the "wood lot." To them a tree in a pasture is "a plant out of place," and therefore a *weed*, to be rooted out and destroyed. But there are good reasons why the cleared fields should not be entirely destitute of trees. In the first place, they add greatly to the appearance of the whole farm, making it more attractive, and therefore of greater value. A shady pasture is a comfort to the farm stock that is kept within its boundaries. The domestic animals—the horses, the cows, the sheep, and pigs, which we as farmers care for and feed, because they provide for our wants, are more than mere machines for our thoughtless running—they are living creatures possessing capacities for pleasure and pain, and therefore demand at our hands the kindest treatment. But there is another side to this question. The well cared-for animal is the one that pays the best returns. Looked at with the practical dollars and cents view, that care which best provides for the wants of the animal is the most remunerative. Every blow received by a cow at the hands of thoughtless help, costs the owner of the cow something either in milk, or flesh, or both. All pain does not result from violence, and discomfort is as unprofitable in its results as actual pain. If one doubts the discomfort of exposure to the sun of a mid-summer day in an open, unshaded field, it will not require a long experience to convince him of it. Man is not the only creature capable of being sunstruck. A few years ago one of the writer's cows, in the full flow of milk, fell off at once to almost nothing. Investigation showed that she had been thoughtlessly exposed all day in a pasture where there was no tree or other shade. In our plea for shade in pastures we are well assured that abundant returns will be found in the shade alone. But beyond this there is the tree itself. In planting a grove it should be remembered that a White Ash will make as good shade and more valuable timber than Soft Maple. There are often low places in a pasture-field in which a spring may be located, or through which a small stream flows—places where trees will grow vigorously, and still be out of the way should the pasture be turned into a grain field, because the land is not tillable. It is in just such secluded and shady places as these that the farm stock love to escape from the intolerable heat of the sun's rays on many a mid-summer mid-day. The accompanying engraving: "A Cool, Shady Cow Pasture" is a pleasing one, because it is the outgrowth of a true conception of what a pasture should be: namely, comfort and satisfaction to the dumb but appreciative animals, and pleasure and profit to the thoughtful, kind-hearted owner of the farm and the stock.

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Calendar for July, 1880.

Day of Month.	Day of Week.	Boston, N. England, N. York State, Michigan, Wisconsin, Iowa, and Oregon. Sun rises.	Sun sets.	Mo'n rises.	N. Y. City, Ct., Philadelphia, New Jersey, Penn., Ohio, Indiana, and Illinois. Sun rises.	Sun sets.	Mo'n rises.	Washington, Maryland, Virginia, Kentucky, Missouri, and California. Sun rises.	Sun sets.	Mo'n rises.
		H. M	H. M	H. M.	H. M	H. M	H. M.	H. M	H. M	H. M.
1	T	4 27	7 41	0 6	4 32	7 35	0 11	4 38	7 29	0 15
2	F	4 27	7 41	0 37	4 33	7 35	0 42	4 39	7 29	0 47
3	S	4 28	7 40	1 12	4 33	7 35	1 18	4 39	7 29	1 24
4	S	4 28	7 40	1 53	4 34	7 34	1 59	4 40	7 29	2 5
5	M	4 29	7 40	2 40	4 35	7 34	2 46	4 40	7 28	2 53
6	T	4 30	7 40	3 33	4 35	7 34	3 39	4 41	7 28	3 45
7	W	4 30	7 39	sets	4 36	7 34	sets	4 41	7 28	sets
8	T	4 31	7 39	8 16	4 36	7 33	8 12	4 42	7 28	8 9
9	F	4 32	7 38	8 43	4 37	7 33	8 41	4 43	7 27	8 38
10	S	4 32	7 38	9 9	4 38	7 33	9 7	4 43	7 27	9 6
11	S	4 33	7 37	9 32	4 38	7 32	9 32	4 44	7 27	9 32
12	M	4 34	7 37	9 56	4 39	7 32	9 57	4 45	7 26	9 58
13	T	4 35	7 36	10 21	4 40	7 31	10 23	4 45	7 26	10 25
14	W	4 35	7 36	10 48	4 41	7 31	10 52	4 46	7 25	10 55
15	T	4 36	7 35	11 21	4 41	7 30	11 25	4 47	7 25	11 30
16	F	4 37	7 35	morn	4 42	7 29	morn	4 48	7 24	morn
17	S	4 38	7 34	0 1	4 43	7 29	0 6	4 48	7 24	0 12
18	S	4 39	7 33	0 49	4 44	7 28	0 56	4 49	7 23	1 8
19	M	4 40	7 32	1 49	4 45	7 27	1 56	4 50	7 22	2 3
20	T	4 41	7 32	3 0	4 46	7 27	3 6	4 51	7 22	3 13
21	W	4 42	7 31	rises	4 46	7 26	rises	4 51	7 21	rises
22	T	4 43	7 30	7 54	4 47	7 25	7 52	4 52	7 20	7 49
23	F	4 43	7 29	8 24	4 48	7 24	8 23	4 53	7 19	8 22
24	S	4 44	7 28	8 51	4 49	7 24	8 51	4 54	7 19	8 51
25	S	4 45	7 27	9 16	4 50	7 23	9 17	4 55	7 18	9 19
26	M	4 46	7 26	9 41	4 51	7 22	9 44	4 56	7 17	9 46
27	T	4 47	7 25	10 8	4 52	7 21	10 12	4 56	7 16	10 16
28	W	4 48	7 24	10 38	4 53	7 20	10 43	4 57	7 15	10 47
29	T	4 49	7 23	11 12	4 54	7 19	11 17	4 58	7 14	11 23
30	F	4 50	7 22	11 50	4 55	7 18	11 56	4 59	7 13	morn
31	S	4 51	7 21	morn	4 56	7 17	morn	5 0	7 12	0 3

PHASES OF THE MOON.

MOON.	BOSTON.	N. YORK.	WASH'N.	CHA'STON	CHICAGO.
	D. H. M.	H. M.	H. M.	H. M.	H. M.
New M'n	7 8 37 mo.	8 25 mo.	8 13 mo	8 1 mo.	7 31 mo.
1st Quart	15 1 32 mo.	1 20 mo.	1 8 mo	0 56 mo.	0 26 mo.
Full M'n	21 4 18 ev.	4 6 ev.	3 54 ev.	3 42 ev.	3 12 ev.
3d Quart.	28 6 57 ev.	6 45 ev.	6 33 ev.	6 21 ev.	5 51 ev.

AMERICAN AGRICULTURIST.

NEW YORK, JULY, 1880.

Hints for the Work of the Month.

[*The Hints and Suggestions in these columns are never copied from previous years, but are freshly prepared for every month, from the latest experience and observations, by practical men in each department.*]

Harvesting.—The work of harvesting the wheat, oats, barley, etc., should be begun before the grain is fully ripe, as it is less liable to shrink and is therefore heavier and of a better quality. The straw is worth more if the crop is cut before the grain is fully ripe, an important consideration on every farm where straw is used for fodder. There is also less waste from the shelling of the grain in the process of harvesting; while the work can be performed without that hurry and rush which must be experienced if the grain is left until later. A delay from unfavorable weather does not involve a serious loss when the work is begun early, and in season.

Corn.—The cultivator should be kept going, to both kill the weeds and pulverize the soil and keep it damp and mellow. When the corn gets large the horse should be muzzled that he may not be nibbling at the corn and forget his work among the abundant green fodder. It should be kept in mind that the work of cultivating the corn crop has a great influence upon the growth of the crops that are to follow. The full returns for work done in the corn field are not all in when the corn is gathered, a point that should always be borne in mind.

Summer Fallow.—A summer fallow was formerly considered the proper preparation for a wheat crop. Where hoed crops are introduced into a regular rotation of crops, the desired cleaning of the land and pulverization of the soil may be effected without resorting to the more expensive method of fallowing. This being the case, the increase in the amount of roots grown will diminish the acreage devoted to summer fallow.

Wheat.—When wheat follows oats in the rotation, the stubble may be stirred with a cultivator to give the scattered oats a chance to sprout before plowing for the wheat crop. If the oat crop is harvested before the grain is fully ripe, as it should be, there is less need of this precaution.

Turnips.—Flat turnips may be sown this month for early feeding. Although not so profitable for the main crop as Swedes or mangels, they have their place in a farm system that economizes labor by its uniform distribution throughout the season. Flat turnips are not to be recommended as feed for cows giving milk, but they are valuable for sheep, especially in making a gradual change from grass to the dry feed of winter.

Fodder Corn may be sown in succession as directed in June, as late as the middle of this month. The small quick growing varieties are to be preferred. The latter part of July and through the month of August, in our northern climate, the pastures get dry in average seasons, so that a modified soiling system is desirable to secure a full supply of feed for the cows and horses.

Fodder Crops in the shape of Millet or Hungarian grass may be sown during the early part of this month, and as the hay crop is very light in many places, a fodder crop of some kind will be more than usually important this year. The soil for a fodder crop should either be naturally rich or made so by manuring, or it will not pay to prepare it for any of these quick growing grains which have but little time in which to make their growth, and must get to a good size in order to be profitable.

Meadows.—As soon as may be after the hay is gathered give the meadows a good top dressing of fine manure. This will produce a thick bottom growth to shade the ground and prevent the soil from drying up and injuring the roots of the grasses.

Water Supply.—An abundant supply of pure water is essential to keep animals in a healthy and thriving condition. The importance of pure water for animals is too often overlooked. Impure water is a fruitful source of disease to animals as well as man, and the quality of milk is impaired when cows are compelled to drink at stagnant pools.

Cows giving milk should not be allowed to fall off in quantity from insufficient feed. It is more difficult to increase the flow of milk after a shrinkage from lack of full feed than to keep up a high activity of the secretion by artificial feed. When the habit of diminished milk secretion at a particular time of year is established, as it will be by repetition, it is not always easy to prevent it entirely by liberal feeding. The habit will also be transmitted to the offspring as a family characteristic that will diminish the value of the animal as a producer of milk. Give the cows extra feed so soon as the pasture begins to get short.

Horses need good care in these hot days of midsummer. They should be kept clean by frequent currying and occasional washing of the legs and feet. The flies will cause the most inconvenience, and while working in the field some protection from them in the shape of nets or thin blankets (sheets) is a great comfort to the animals. Keep the stables clean that they may not harbor the flies or develop any bad odors. Horses that are at regular farm work need good food—better than grass alone will give. Oats or ground feed of some kind must supplement the pasture at night.

Sheep can care for themselves if they have a shady pasture supplied with good water. The matter of a ram to be used later in the season should be considered now and secured in time, if not already on hand. A full-blood will often improve the flock.

Pigs.—A run in a good clover stubble will be beneficial. The yards should be kept as clean as possible. A quantity of copperas sprinkled about the pens will deodorize and disinfect the place very satisfactorily and cheaply. Young pigs should be pushed now if they are for early market. A rapid growth secured now is of the greatest importance. If the stock is not what is desired begin to improve it at once by securing a pure-blood boar of some good breed to use in the herd.

Poultry.—Chickens hatched this month will, if well cared for, be large enough to get through the winter safely. It is not best to set any hens after July. Vermin breed very fast in hot weather and great cleanliness is necessary.

Growing Seed Corn.—It has been conclusively shown that any grain can be improved by a careful and continued selection of the seed. This is especially true of corn—and it is a grain in which a selection can be most easily and thoroughly car-

ried out. Any farmer can select a given portion of his corn field for seed, and can thin, remove suckers, poor stalks—those with imperfect ears, etc., and in that way increase the growth of the best ears, with sound and vitally strong grain.

Late Potatoes will need constant watching for the Beetle, which should not be allowed to do any damage; kill the insects at their first appearance by an application of poison.

Buckwheat as a late crop to fill out with, when another has been removed or failed to grow, can be sown up to the middle of the month. A bushel of seed per acre is an abundance to sow.

Cleanliness.—The utmost neatness should be exercised about the premises in the hot weather. Garbage of every kind should be disposed of before it becomes decayed and is giving off a bad odor.

A Compost Heap is the proper place for all decomposable waste material. It should be situated in an out-of-the-way place, but near at hand, so that all weeds, waste, and decomposable litter of all sorts, may be carted upon it quickly and easily.

Notes on Orchard and Garden Work.

The cultivator, whether of the orchard or garden, should make it a part of his programme to take a vacation, and this from necessity must come in mid-summer. This can be devoted merely to recreation—a most excellent use to make of it—or it may be turned to good account in making visits to others engaged in the same pursuits. A grape grower, for example, can make no better investment of his time and money than to go to Hammondsport or some other town on Lake Keuka, and from there visit the many neighboring vineyards. The nurseryman should go to Rochester or Geneva, N. Y., where he will find the largest nurseries in the country. Other cultivators can readily find centers where special attention is given to the things in which they are interested, and a visit to these will not only afford recreation, but will be very sure to pay in the instruction that an intelligent observer can always gain from seeing the operations of others.

Another matter should receive early attention—preparation for the autumn fairs. The fair season will begin in a little over two months, and it is none too early to consider the matter. The local fair, whether county or other, should receive the attention of every cultivator, whether he belongs to the class called "amateur," or to the "professionals," as those who cultivate plants of any kind as a business are called. A lively competition for the prizes, no matter how small these in themselves may be, is the only way in which a fair, large or small, can be made useful to the community. Every cultivator should make it a point to show his best products, and if any one exhibits better ones than his own he may be sure that there is something about varieties, or their cultivation, that he should learn. Besides these smaller fairs, those engaged in any branch of horticulture as a business, should show their products at the State or other large Fair, if only for the sake of making himself and his business known. It is none too soon to decide what shall be exhibited at the coming fairs, and what prizes upon the schedule are to be competed for, and to give the articles early attention in order that the exhibit may be a creditable one. If one competes for varieties of pears, as an example, for the half dozen or dozen to make the "plate," should be selected before hand, and all smaller and poorer fruit near them on the tree be removed in order to secure the greatest possible development of those selected. So with other fruits, and a like course is to be pursued with vegetables, flowers, etc.

Orchard and Nursery.

Budding.—So soon as the bark of the stock will "run," that is, when it raises readily, and the buds are well formed, the budding may be done. In August, 1877, we gave full directions with illustrations, and as we can not repeat every year, the reader who is in need of such instructions is referred to the number mentioned, which if not at hand, can be sent by us, post-paid for 15 cents.

Thinning.—It will pay to thin the fruit from overloaded trees, even though it is getting late. The fruit that remains will be of better size and quality, and the benefit to the tree, especially if it is young, will make it pay for the labor of thinning.

Grafts will need to be looked to; they must not be interfered with by surrounding branches, some of which may need to be cut away. All grafts growing too vigorously should be pinched back.

Pruning can be done during this month. An open head to the tree should be kept in mind, that the air and sunlight may readily reach the interior.

Marketing.—The early fruit will be largely marketed this month. Too much care can not be exercised in having it put up with neatness. Tidy packages neatly marked and filled with selected fruit, always bring a good price, even when the market is full of inferior fruit. Get and hold a reputation for uniformly good fruit—as it pays.

Tent Caterpillar.—The nests that have escaped the earlier rounds should be destroyed, or these greedy "worms" will rapidly strip the trees of their leaves, and thus greatly retard their growth.

Codling Moth is best caught by using bands of hay or paper put around the trunks of the trees. Remove the bands every week or so, and kill the insects that have gathered beneath them.

Blight is the most mysterious of all the enemies which affect the success of the fruit frower. Other troubles either give warning of their approach, or are to be traced to some direct cause. With this, the fruit grower's only knowledge of it is the death of a part of the tree, and not rarely the whole of it. The tree that was yesterday a model of thrift and productiveness, will be to-day a mass of dead wood, bearing scorched and blackened foliage, a cumberer of the ground. When it appears, cut away the portions killed, removing the whole tree if found necessary.

The Fruit Garden.

Grape-Vines.—For the first two years a stake is a sufficient support, after which some kind of trellis should be provided. Keep the shoots you wish to preserve well tied up, and as others start remove them. The little branches that are coming out at the point where the leaf joins the main stem, are the *laterals*, which should be pinched back to the first leaf, and if it makes another start, pinch it back again. Stop any shoots by pinching when they are as long as desired. The insects that appear are in most cases best removed by hand-picking.—See article on this subject on page 273.

Mildew appears first in white patches on the under surface of the leaves, and afterwards upon the fruit, and should be kept in check by using the Flowers of Sulphur, applied with a bellows on a still morning. It is best to apply the Sulphur when there is dew upon the vines, or just after a rain, as the dry powder sticks to the vines better. The sulphuring should be repeated at intervals of a few days until the mildew disappears. Bellows for the purpose are sold at the seed and implement stores.

Currants.—If the fruit is for making jelly, pick it when well colored and before it is dead ripe, but if to be eaten fresh at home, it should remain on until thoroughly mature. The long shoots that push up from the interior of the bush should be broken off while young. Any other thinning that is necessary may be done now with advantage.

Blackberries and Raspberries.—Those canes that are to be left for fruit bearing next year should be stopped by pinching at 6 feet for Blackberries, and 4 feet for Raspberries. All other shoots are to be treated as weeds and cut away early in their growth. So soon as the fruit is off the old canes have finished their work, and should be cut away.

Strawberries.—When the picking is over, remove the mulch of straw, etc., give the soil a good coat of manure, well forked in, and keep the bed clean of weeds. If the single row system is followed, the runners are to be kept cut off, unless plants are wanted to set new beds. In the alternate system the runners are to be encouraged to make plants in the forked and manured "paths" between the old rows. Pot layering is now quite extensively practised, and is to be commended for private gardens. It consists in sinking small pots filled with rich soil in the soil of the bed into which the runners may strike their plants; afterwards plant, soil and all is transferred to the new bed. Plants thus obtained will bear a good crop the next season.

Kitchen and Market Garden.

We made special mention of the value of the hoe and rake in the garden last month, and it can not be too forcibly stated that upon their frequent use the success of the vegetable garden depends; at this time, when the planting is pretty well over, the tending of the growing crops is the principal work.

Asparagus.—Let the plants grow up and form a dense mass of green. Pull out any large weeds—the shade will prevent the growth of small ones.

Beans.—Bush sorts, like the "Refugee," may be still planted for late use and pickling. The Limas, if very vigorous, and inclined to run beyond their poles, may be pinched at the top of the pole.

Beets.—Sow for a succession for greens and young roots. Keep the weeds out and the soil loose.

Cabbage and Cauliflowers.—Set for late crop in a rich soil, and watch for the worms, which, if they appear, may be killed by the use of hot water.

Celery should be set now, in rows three feet apart and six inches in the row. The trench system is entirely superseded by that of cultivating on the level surface and blanching late in the season by throwing up the earth in ridges around the plants.

Carrots.—Hoe so long as the tops do not interfere with the work, and thin when too close.

Corn.—Early sorts may be planted for late use and drying. The seed of the best specimens should be saved for planting next year.

Cucumbers.—Dust with ashes to keep off the "bugs" and other insects. Pick the small fruit every day for pickles. Those two inches long are best.

Egg Plants.—By using liquid manure, the plants may be forced greatly. The fruit should be kept off of the ground, by using a layer of straw.

Melons.—The late set fruit will not ripen, and had best be removed. Save seed from best specimens.

Onions.—When the tops lie down, the onions are ready to be harvested. Store in a cool airy place after being thoroughly dried in the sun.

Sweet Potatoes.—The vines should not become rooted at the joints. Move them when hoeing.

Squashes, unlike the sweet potatoes, may strike root at the joints with advantage. Keep the bugs off.

Tomatoes.—Use some sort of trellis to keep the fruit from the ground; if there is no trellis, use brush or even hay to keep the fruit from the ground.

Flower Garden and Lawn.

The main work now is to keep everything in order.

Lawn.—The mower must be frequently used, and the corners, borders, and out-of-the-way places "trimmed up" with a sickle. Any large weeds that come up, should be dug out by the roots.

Walks and Drives will need an occasional hoeing and raking, and the roller passed over to smooth and harden them. The margins should be neatly trimmed with large shears at frequent intervals.

Bedding Plants need much care, as they grow rapidly, and unless the knife is frequently used, will get in bad shape, and attractiveness is lost.

Dahlias, Gladioluses, etc., will need stakes to support them, but simple unnoticeable poles firmly driven into the soil are preferable to painted sticks.

Climbers are to be looked to, and care taken that they have ample means of support.

Annuals and Perennials, should have no weeds amongst them. Unless seeds are to be saved, cut away the clusters as soon as the bloom fades.

Greenhouse and Window Plants.

This is the most difficult time of the year to make the greenhouse look attractive. The beauty and attraction are now out-of-doors. Much shading must be done, with either heavy coats of whitewash on the glass, or by using muslin. Frequent watering and wetting down of the walks, etc., is necessary to keep the house cool. Fumigate at frequent intervals. Get stock of moss from bogs if the weather is dry, and soil from the woods.

Commercial Matters—Market Prices.

The following condensed, comprehensive tables, carefully prepared specially for the *American Agriculturist*, from our record kept daily during the year, show at a glance the transactions *for the month ending June 10th*, 1880, and for the corresponding period last year:

1. TRANSACTIONS AT THE NEW YORK MARKETS.

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
22 d's *this* m'th	401,000	3,605,000	4,117,000	102,000	291,000	1,108,000
23 d's *last* m'th	345,600	2,214,000	3,210,000	76,000	301,000	881,000
SALES.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
22 d's *this* m'th	347,000	23,794,000*	7,491,000*	156,000	——	2,337,000*
23 d's *last* m'th	326,000	24,856,000*	6,983,000*	207,000	292,000	2,453,000*

* Including sales for forward delivery.

2. *Comparison with same period at this time last year*

RECEIPTS.	*Flour.*	*Wheat.*	*Corn.*	*Rye.*	*Barley.*	*Oats.*
22 days 1880	401,000	3,605,000	4,117,000	102,000	291,000	1,108,000
27 days 1879	447,000	4,510,000	3,107,000	385,000	339,000	952,000
SALES.	*Flour.*	*Wheat.*	*Corn*	*Rye.*	*Barley.*	*Oats.*
22 days 1880	347,000	23,794,000	7,491,000	156,000	——	2,337,000
27 days 1879	502,000	10,763,000	6,215,000	603,000	101,000	1,469,000

3. *Stock of grain in store at New York.*

	Wheat. bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Malt.* bush.
June 7, '80	1,251,334	103,442	61,464	26,425	461,490	184,747
June 10, '79	1,984,368	744,320	118,773	128,542	217,016	84,549
June 11, '78	1,487,700	676,626	148,389	197,507	603,152	238,285

4. *Exports from New York, Jan. 1 to June 10.*

	Flour. bbls.	*Wheat.* bush.	*Corn.* bush.	*Rye.* bush.	*Barley.* bush.	*Oats.* bush.	*Peas.* bush.
'80	1,781,000	23,105,000	16,476,000	982,000	271,000	124,000	28,300
'79	1,316,000	18,872,498	13,873,494	1,843,600	100,800	326,400	173,450
'78	1,119,950	20,252,242	10,805,561	1,904,500	1,477,800	747,400	252,200

CURRENT WHOLESALE PRICES.

	May 10.	June 10.
FLOUR—Super to Extra State	$3 65 @ 5 25	$3 35 @ 5 00
" Super to Extra South'n.	3 75 @ 7 50	3 35 @ 7 00
" Extra Genesee	5 25 @ 6 50	5 00 @ 6 25
" Superfine Western	3 65 @ 4 80	3 35 @ 4 50
" Extra Western	4 35 @ 8 50	4 00 @ 8 50
" " Minnesota	4 75 @ 8 50	4 10 @ 8 50
RYE FLOUR, Superfine	4 65 @ 5 25	4 60 @ 5 00
CORN-MEAL	2 50 @ 3 20	2 50 @ 3 15
CORN-FLOUR, per bbl	3 25 @ 3 90	2 90 @ 3 50
OAT MEAL, ₱ bbl	4 25 @ 6 50	4 50 @ 6 50
WHEAT—All kinds of White	1 20 @ 1 26	1 20 @ 1 30
" Red and Amber	1 00 @ 1 30	1 15 @ 1 33
" Spring	1 00 @ 1 26	1 05 @ 1 22
CORN—Yellow	52 @ 56	55 @ 58
" White	51 @ 56	55 @ 58
" Mixed	50 @ 53	52 @ 55
OATS	40 @ 50	39 @ 47½
RYE	90 @ 92	96 @ 98
BARLEY	55 @ 1 00	Nominal.
HAY—Bale, ₱ 100 lbs	70 @ 1 00	70 @ 1 05
STRAW, ₱ 100 lbs	50 @ 1 05	50 @ 1 15
COTTON—Middlings, ₱ lb	11¾@ 11¾	11⅞@ 12
HOPS—Crop of 1879, ₱ lb	27 @ 40	27 @ 40
" " 1878, ₱ lb	7 @ 18	7 @ 20
" olds, ₱ lb	4 @ 12	4 @ 12½
FEATHERS—Live Geese, ₱ lb	40 @ 55	45 @ 52½
SEED—Clover, West. & St. ₱ lb	5¾@ 7¾	6¾@ 7¾
" Timothy, ₱ bushel	2 40 @ 2 65	2 40 @ 2 65
" Flax, ₱ bushel	1 40 @ 1 60	1 40 @ 1 55
TOBACCO, Kentucky, &c., ₱ lb	3 @ 14	3 @ 14
" Seed Leaf, ₱ lb	6 @ 40	6 @ 40
WOOL—Domestic Fleece, ₱ lb	30 @ 58	28 @ 55
" Domestic, pulled, ₱ lb	25 @ 56	25 @ 56
" California	17 @ 42	18 @ 38
TALLOW, ₱ lb	6 @ 6¾	6 @ 6¾
OIL-CAKE—₱ ton	— @$32 00	$32 50 @$33 00
PORK—Mess, ₱ barrel	10 50 @10 90	11 35 @11 40
" Extra Prime, ₱ barrel	9 50 @10 00	9 50 @ 9 75
BEEF—Extra mess	10 50 @11 00	10 00 @10 50
LARD, in trcs. & bbls, ₱ 100 lb	7 15 @ 7 65	6 50 @ 7 40
BUTTER—State, ₱ lb	14 @ 25	13 @ 21
" Western, poor to fcy. lb	9 @ 23	9 @ 20
CHEESE	8 @ 13½	8 @ 12½
EGGS—Fresh, ₱ dozen	9 @ 12½	10 @ 13
POULTRY—Fowls, ₱ lb	6 @ 14	8 @ 14
" Chickens, ₱ lb	14 @ 35	18 @ 34
" " ₱ pair	40 @ 1 00	35 @ 90
" Roosters, ₱ lb	— @ —	4 @ 6
Capons, ₱ lb	20 @ 26	18 @ 22
Turkeys—₱ lb	9 @ 13	8 @ 11
Geese, ₱ pair	1 00 @ 1 50	1 00 @ 1 50
Geese, ₱ lb	10 @ 13	— @ —
Ducks, ₱ pair	50 @ 80	50 @ 80
" ₱ lb	10 @ 18	— @ —
PLOVER, ₱ doz	1 50 @ 2 00	1 50 @ 2 00
PIGEONS, ₱ dozen	50 @ 2 75	40 @ 2 50
SNIPE, per doz	50 @ 2 25	20 @ 2 00
APPLES, ₱ barrel	2 50 @ 5 00	2 00 @ 4 50
STRAWBERRIES, ₱ quart	10 @ 25	3 @ 12
GOOSEBERRIES, ₱ bushel	— @ —	7 @ 10
CHERRIES, ₱ lb	— @ —	5 @ 15
POTATOES, new, per bbl	3 50 @ 5 50	2 00 @ 5 00
" ₱ bbl	1 25 @ 1 75	1 00 @ 1 75
" Sweet, ₱ bbl	2 50 @ 3 25	— @ —
TOMATOES, new, per box	20 @ 90	60 @ 3 00
TURNIPS ₱ bbl	75 @ 1 25	75 @ 1 25
" white, new, ₱ 100 bun	— @ —	75 @ 2 00
BEANS—₱ bushel	1 25 @ 1 75	1 25 @ 1 75
PEAS—Canada, in bond, ₱ bu	— @ 81½	82 @ 85
" new, green, ₱ bag	— @ —	— @ —
" new, per bbl	1 50 @ 3 50	2 00 @ 5 50
STRING BEANS, new, p. crate	75 @ 2 00	75 @ 2 50
CARROTS, ₱ bbl	1 25 @ 1 75	1 50 @ 3 00
BEETS, ₱ 100 bunches	— @ —	1 50 @ 3 00
" new, per crate	1 75 @ 2 00	— @ —
CABBAGES, new, ₱ bbl	1 00 @ 3 25	1 50 @ 3 50
ONIONS—₱ bbl	3 50 @ 4 50	— @ —
" ₱ crate	— @ —	1 75 @ 3 00
SQUASH, ₱ bbl	1 50 @ 1 75	1 50 @ 2 00
" ₱ crate	— @ —	25 @ 50
SPINACH, ₱ bbl	1 25 @ 1 75	50 @ 75
ASPARAGUS, new, ₱ doz. bun	75 @ 2 50	75 @ 1 75
RADISHES, new ₱ 100 bun	50 @ 1 50	1 00 @ 1 25
CUCUMBERS, ₱ 100	75 @ 1 50	— @ —
" ₱ crate	— @ —	1 75 @ 2 50
LETTUCE, ₱ bbl	— @ —	1 50 @ 2 75

Increasing ease in money has contributed to activity at the Stock Exchange, where values—though variable—have been generally on the advance; and served also to stimulate dealings in Real Estate at improving prices.... As usual at this season of the year, general merchandise has been comparatively dull, the demand narrowing down to the most urgent requirements of buyers, who have been enabled in several instances to obtain concessions, under a more or less decided pressure to place supplies....Cotton has diminished perceptibly in the interest shown by operators, whether for prompt or forward delivery; and has hardened slightly in price, as the offerings have not been very urgent....Wool has also been in light request and has further declined, leaving off irregularly, pending the free receipt of the new clip...Naval Stores and Petroleum have been advanced, partly through speculative dealings, and have shown more animation.... Provisions have been moderately active, but have been quoted, in nearly all instances, lower. Offerings of Butter have been on a liberal scale. Cheese has recently met with more attention, in good part from shippers, and closed with some indications of firmness on the more desirable makes. Eggs have been on the advance within the past few days, on a better demand....Breadstuffs have shown decided activity—largely on speculative account, which has been accompanied by more or less serious disturbance of values. Wheat felt the influence of speculative manipulation, most notably No. 2 Red, of the Winter grades, having been the favorite, was run up very rapidly against operators having deliveries to make on May contracts—touching, at one time, as high figures as $1.46¼@$1.47; but, following the May settlements, broke down to $1.30@$1.32, and left off at about $1.30@$1.31, with corresponding depression and disturbance in options,—especially for June,—which month is now the center of the speculative interest. Increasing receipts, rather unfavorable foreign market advices, and generally encouraging crop reports worked, near the close, against operators for another advance. Corn ruled higher through the earlier dealings, but has weakened materially within a few days, as the supplies have been gaining on the requirements of buyers. Oats have also fluctuated widely,—leaving off much lower, on freer and urgent offerings. Rye has been in light stock and wanted for export at much higher figures. Flour has been generally on the decline, on a moderate movement for home use and shipment. The visible supplies of Wheat—embracing the hoards at lake ports, in transit, and on the seaboard—at latest dates, embraced about 20,395,000 bushels,—of Corn, 15,785,000 bushels; of Rye, 365,600 bushels; of Barley, 487,000 bushels, and of Oats, 2,731,000 bushels, against on January 31, an aggregate of 30,100,000 bushels Wheat, 13,100,000 bushels Corn, 979,000 bushels Rye, 4,155,000 bushels Barley, and 3,080,000 bushels Oats. Ocean Grain freights have been unusually active—largely in the speculative line—but at lower rates, closing rather stronger, including by steam to Liverpool. 3¾*d.*@4*d.* per bushel; to Bristol, by steam, to 7*d.* per bushel; to Antwerp, by steam, to 8¼*d.* per bushel, and by sail to Cork, for orders for vessels of average carrying capacity—say 3,000 to 4,000 qrs.—4*s.* 3*d.*@4*s.* 6*d.* per qr. of 480 lbs.

New York Live-Stock Markets.

RECEIPTS.

WEEK ENDING	*Beeves.*	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
May 17	15,787	49	6,254	34,413	32,922
May 24	14,409	25	6,532	32,997	33,413
May 31	16,188	39	6,683	36,812	26,240
June 7	15,362	37	5,644	38,356	23,723
Total for 4 Weeks	61,746	150	25,113	142,638	126,298
do. *for prec. 5 Weeks*	97,425	314	23,499	132,524	182,925
	Beeves.	*Cows.*	*Calves.*	*Sheep.*	*Swine.*
Average per Week	15,436	37	6,278	35,659	31,574
do. do. *last Month*	13,485	69	4,700	26,505	36,385
do. do. *prec's Month*	12,591	181	1,974	26,481	31,993

Prices for beeves the past four weeks were as follows:

WEEK ENDING	*Range.*	*Larger Sales.*	*Aver.*
May 17	8 @10¾c.	8¾@ 9½c.	9¼c.
May 24	8¾@10¼c.	8¾@ 9½c.	9¾c.
May 31	8 @10¼c.	8½@ 9¼c.	9¼c.
June 7	8¾@10½c.	8¾@ 9½c.	9¼c.

Beeves.—The receipts for the first week were very heavy, with a large call for export, and a good demand for home use. The market has been unusually steady throughout the month, and it will be seen from the table of averages that there has been but little rise and fall in this market. The decline in the third week was caused by the extreme heat, which made the market dull, but with a quick recovery—and at date of writing both exporters and home traders are operating freely with an active market. Colorado corn-fed cattle sold at 8¼@9c. Choice native steers, to dress 56 lbs., brought 8¼@10c., and a few selected to dress 57 lbs., sold at 10¼@10¾c....

Milch Cows.—There has been a great falling off in the number of cows sold; the average not being much above one-half that of last month. The very light arrivals have been sold at prices ranging from $25 to $50....

Calves.—A very liberal supply and the warm weather caused a slow market in the middle of the month. Buttermilk calves were dull and not wanted except at low figures. Prime Veals were in some demand; mixed lots of the former sold at 3@4c.. and select Veals at 5¼@5¾c. with a few exceptionally fine at 6c....**Sheep and Lambs.**—The receipts at the first of the month were large, and the market was under the control of the buyers. Lambs were abundant and dull at first, but the demand increased through the month, until the last week, when they were again abundant and at low figures. Colorados 3¾@6½c. for choice wethers....**Hogs.**—There has been a considerable falling off in the receipts of hogs. Market quoted nominally at 4¾@5c. at the close of the month; none for sale alive.

The Horse Market.—There is a moderate business in horses though the spring trade is over. Dealers are confident that selling rates will have to be lower for common stock. A few fine animals are coming in from abroad—among them is a fine Norman Stallion from France to go to Ohio. Street-car horses sold for $110@$130, and good work horses at $150@$200. Good carriage teams, according to speed, etc., ranged from $450 to $800.

Prices of Feed.

Cotton-seed meal	per ton.	$30.00
Linseed-cake meal	"	37.50
Middlings	"	24.00
Bran	"	23.00
Corn-meal	"	25.00

Prices of Fertilizers.

Nitrate of Potash (95 per cent.), per lb.	8 @8½c.
Sulphate of Potash (potash 44 per cent) per lb.	3½@4 c.
do. do. (potash 27½ per cent) per lb.	1½@1¾c.
German Potash Salts (potash 12 to 15 p.c.) p. ton.	$16.00@18.00
Muriate of Potash (potash 50 per cent), per lb.	2 @2¼c.
Nitrate of Soda, per lb.	5@5¼c.
Sulphate of Ammonia (25 per cent.), per lb.	4 c.@4¼c.
Dried Blood (ammonia 13 per cent) per ton	$40.00@45.00
No. 1. Peruv. Guano 9 p. ct. ammonia, standard, ₱ ton	$35.00
do. do. Lobos, do. do, do.	46.00
do. do. guaranteed, ₱ ton, cargo K	56.00
Soluble Pacific Guano, ₱ ton	45.00
Excelsior Fertilizer Works, Fine Ground Raw Bone,	25.00
Mapes' Complete Manure (clay soils) per 1,000 lbs.	25.50
do. do. do. (light soils) per 1,000 lbs.	25.50
do. do. do. "A" Brand, (wheat) ₱ 1,000 lbs.	30.00
do. Beet do. per ton	49.50
do. Cabbage do. do.	47.50
do. Tobacco do. do.	52.00
do. Fruit and Vine Manure, per ton	37.00
do. Asparagus Manure, per ton	51.00
Stockbridge Rye Manure, do.	45.00
" Wheat do. do.	45.00
" Seeding Down Manure, do.	40.00
Bowker's Wheat Phosphate, per ton	40.00
Baugh's Raw Bone Phosphate, per ton	33.00
Baugh's Manure for Tobacco and Grain, per ton	45.00
Walton, Wham & Co.'s Raw Bone Phosphate	40.00
Gypsum, Nova Scotia, ground, per ton	8.00

Potash Salts.—"H. L. B.," Erie Co., Pa. The articles on "Science Applied to Farming" in the *American Agriculturist* for November and December, 1877, and April, 1880, give full information about the German Potash Salts. It is impossible to lay down rules for their use to apply to all cases. The only way is to "try and see." They both succeed and fail on all sorts of soils, from gravel to heavy clay. For potatoes they are generally profitable. For clover, corn, and grass they do well as often as they fail. For wheat, oats, etc., they are less commonly profitable. Such is the testimony of our field experiments and of general experience. For general use, the muriate, with 80 per cent or more of chloride of potassium, corresponding to 50 per cent or over, actual potash, and sold at $40.00 to $45.00 per ton, is the best grade to buy, because it furnishes more potash for the money than any other. For tobacco and potatoes the sulphates are recommended on the ground that they have a better effect upon the quality of the crop. But they are harder to obtain pure, are more costly, and, so far as the testimony of our experimenters goes, the muriate brings potatoes of excellent quality. The Leopoldshall Kainit is a low grade potash salt, averaging about 12⅓ per cent actual potash, and consisting largely of common salt. It is not to be recommended unless it can be had at very low rates; it is not worth more than $13.00-$16.00 per ton.

Hen-Manure.—"S. C.," Lynn, Mass. Hen-manure varies greatly in composition and value, according to the food of the fowls; whether they are growing or laying eggs or not; and especially how much it is decomposed; and how much water, earth, straw, etc., it contains. Three samples analyzed at the Connecticut Experiment Stations gave from 44 to 71 per cent of water, 0.8 to 0.9 (8 to 9-tenths of one) per cent of nitrogen, 0.4 to 0.6 per cent phosphoric acid, and 0.4 to 0.5 per cent potash. That is, they had about one-tenth as much of the most valuable fertilizing ingredients as No. 1 Peruvian Guano. The samples had about as much phosphoric acid and potash, and twice as much nitrogen, as ordinary horse or cow-manure. At valuations current for commercial fertilizers they would be worth about $5.00 per ton. The water and earthy matters amounted in each of the three samples to a little over four-fifths of the whole. The pure dry dung would contain some 4 per cent of nitrogen, 2 per cent each of phosphoric acid and potash. The reasons why the pure dung is so inferior to guano, which is notably bird dung, and contains (No. 1 Standard) over twice as much nitrogen, and six or seven times as much phosphoric acid, are mainly, that the guano birds live on fish, a far richer food than that of hens, and that the hen-manure is moist and apt to lose considerable nitrogen by decomposition (fermentation, "heating," etc.)

Profitable Farming.—In the conclusion of a long letter to an exchange, Dr. J. B. Lawes remarks; "Although the process and conditions of growing wheat in England, and corn in Maryland, differ in certain respects, still it is my opinion that in both countries, the largest crops will be found to be by no means the most profitable." Beyond a certain point of high culture farming becomes of the "fancy" sort, but in general, our's is not of that sort, and for good reasons will not be, for some time to come: The West is large and still fertile.

Interesting Announcement

FOR ALL YE BOYS,

From 5 to 105 Years Old!

Scroll or Fret Sawing is one of the most delightful amusements, combining pleasure, utility, and a development of taste and skill. Every home, however humble or magnificent, is more beautiful if adorned with brackets and other work produced by home hands. Hundreds of thousands of such homes now exist, where only the slow and tedious hand-frame fret saws have been available. More recently the foot pedal and multiplying wheels have come into use, and the increasing demand has tended to cheapness and improvement. We are now happy to announce another LARGE ADVANCE in

Perfection, Cheapness, and Portability,

by which is secured stronger, better working machines; a material reduction in price, and a great saving in cost of carriage or delivery, as well as in storage room when not in use, with sundry other improvements and advantages.—All the above are secured in

Beach's New Folding Fret Saw.

Figure 1 shows it ready for use, while in half a minute or less it can be folded (*without removing the saw*) to the form, figure 2, occupying but a quarter of the space, to be set away, or put in a small box for sending anywhere at small cost for carriage. By a simple arrangement the table is lowered to a convenient working hight for a boy of 5 or 6, or raised high enough for the tallest man, and at every hight it stands *firmly*.

It has a tilting table, and will execute very fine scroll-work or inlaid-work. The clamps will firmly hold any saw, from the finest No. 00000, up to No. 10; they are readily and quickly inserted or changed. A space of 20 inches behind the saw allows quite as large pieces to be worked as any other instrument of the kind in the market.

By an ingenious arrangement, there are no dead centers, but the wheel starts right off the moment

Fig. 1.—BEACH'S FRET SAW READY FOR USE.

the foot presses the pedal, while it can be instantly stopped by simply pressing the knee against a brake. The upper clamp is hinged to be thrown up for changing the saw, or for inside work. The working parts are iron or steel, finely fitted, securing great durability, while the frame, of tough white ash, or other *tough* timber, is formed to secure the greatest strength. The whole is so *simple* that A CHILD CAN WORK IT. Parents will appreciate the convenience of such an instrument, of full size, yet quickly folding up so as to be set in the corner of a closet if desired. Though as strong and durable as any one could desire,

The Weight is only 15 lbs.

With all the above advantages, and its great superiority over any other hitherto produced,

The Price is only $2.25,

which includes full instructions, so that a beginner can go to work at once. It is packed in a neat box and is delivered to any express office in New York City FREE. The small space required, and the lightness, will reduce the cost of carriage very greatly, as compared with other machines for similar work.

Fig. 2.—THE SAW FOLDED.

The Editors and Publishers of the *American Agriculturist* were so pleased with this new machine that they at once secured the control of it for the benefit of their readers, though it will be supplied to others as soon as it can be produced in sufficient quantity. It will be forwarded by express or otherwise, as directed, in the order of calls for it, at **$2.25** each; or

FREE as a Premium.

A special object in taking hold of this new machine was to secure it for our new Premium List now in course of preparation.

In the meantime, any one will be presented with one in return for *four* yearly subscriptions to the *American Agriculturist* at $1.50, or for eight half-year subscriptions (July to December inclusive) at 75c. each. On receipt of address we will mail our full instructions for using this charming Scroll Saw.

Some Things this Number Contains.

Numerous helpful hints about the Work of the Month, will aid many in this busy season; see pages 254 to 256.

One of the special features of this number is the Second Prize Essay on KEEPING ONE COW, which should be read by every subscriber; pages 270-271.

Plans and specifications for a Country and Village House, costing $3,500, will meet the actual wants of many who desire to build a neat and commodious dwelling. Page 264, with numerous illustrations.

Further experience on the subject of Fences and Fencing, is given on page 261.

Prof. Atwater gives a thorough treatment of the subject of Hungarian Grass, on page 261.

The Humbugs are sundry and important; pages 258-259.

An interesting and instructive article may be found on Training Animals on page 269.

A very practical Plan for Planting Fruit Trees, by S. B. Parsons, with diagram, may be seen on page 273.

For a variety of Household information, including Faith Rochester's entertaining and instructive Notes, see pages 276-277.

The Boys and Girls will know where to turn for their Special Department, and will not be disappointed; pages 278 to 280.

The Basket is unusually full of short items, on various important subjects, pages 257-260, 286-290.

The *Army Worm*, so destructive to farm crops, receives the full attention it deserves, page 260 and 262.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of room elsewhere.

To Subscribers to "Land and Home."—Special Notice.—The subscribers to "Land and Home" will receive the *American Agriculturist* for the remainder of the time for which they have paid their subscriptions to that journal. Those who have already paid in advance for the *American Agriculturist* will have their time extended for an equivalent period. In other words, whatever may have been due in subscriptions to that journal when it discontinued, will be made good by supplying the *American Agriculturist* at the current rates.

Where to Get Things Wanted.—Many *thousands* of letters come to the Editors every year (some with and some without "return postage"), asking where they can obtain from trustworthy parties, implements, animals, poultry, seeds, plants, fertilizers, and a great variety of other things, all of which questions we try to answer when we can. But nine out of ten of these letters, and much valuable time of both writers and respondents, would be saved, if the inquirers would take the little trouble required to just look through the advertising columns, where usually, in one number or another, several parties announce the very things asked about. We try to keep out all parties not trustworthy. If any mistake occurs, after all possible care, we can only acknowledge to having been deceived, *for we do not admit any advertisers whom we would not ourselves patronize when wanting the things they offer.* (The Editors have the "veto power" over any and every advertisement proposed for these columns.) It will always pay to read through the business columns to see what is offered and by whom, and useful hints are often derived from reading what others say and how they say it. New ideas are thus started up in one's mind.—When corresponding with any of our advertisers, or sending for catalogues, etc., it is well to state that you are a reader of *this* Journal. They will know what *we* expect, and what *you* expect of them as to prompt and fair treatment.

SEE:—All interested in the hidden truths and beauties of nature should SEE them, and this can be done by the aid of a *good Microscope*. SEE a full account of the *American Agriculturist* Compound Microscope, page 286.

To Get Rid of Chicken Lice.—Vermin is the pest of poultry, and when chicken houses get thoroughly infested, it is not an easy matter to cleanse them. If the house is washed with a hot lime wash, and the roosts are rubbed with a mixture of kerosene oil and lard, the lice will be made uncomfortable, and if this treatment is repeated a few times, the house and also the fowls will be quite free from vermin. If the house is, as all poultry-houses should be, detached from barns and other buildings, it may be fumigated. Shut it up tight and close every opening. Then place a pan of live coals on the ground (or if it must be on a wooden floor, put down a few shovelfuls of earth, or coal ashes, to hold the pan). Throw on a handful of lumps of brimstone, and get out quickly, closing the door tightly. If the work has been thorough, no lice can be found at the end of a few hours. The white-washing, etc., may be then done.

Stumps.—It is not wise to employ any expensive methods of getting out the stumps on a new piece of land, that is not from location, or otherwise of very great value. It is in most cases cheaper to let stumps rot out. There is a general desire to clear and clean a piece of land all at once, but as in many other things, it may be, "the more haste, and the less speed." The use of dynamite, or any other quick acting and expensive method, is recommended only when the room the stump occupies, is worth a considerable more than the trouble and expense of taking it out while green and difficult to remove.

Insure Farm Buildings.—The average farmer, when his barns are full of grain and hay, can be almost ruined by a fire unless he is well insured; and it is at just that time that barns are most frequently destroyed by fire. Lightning comes mostly in the summer months, and is a common cause of barn fires. It is best to be insured in a good company near at home.

The House Plan.—For several months we have been giving our readers plans and estimates of cottages or houses of moderate cost, and suitable for only a small family. This month a larger, more commodious dwelling is presented in all its details, and will doubtless answer the ends of many, who contemplate building a house that will cost in the neighborhood of $3,500.

Two Acres—What can be done on them.—There are books on "Ten Acres Enough," "Five Acres too Much," "My Farm of Four Acres," etc., all interesting and instructive to many people; but for a short, concentrated, telling account of what has been done, is being done, and can be done on "Two Acres," we commend the reader to go through with the Essay on "Keeping One Cow," on page 270 of this paper.—There is hardly a cultivator in all the country, whether of a large or small farm, or of the smallest village plot, that may not get some useful hints from Mr. Battles' plain account of his method and the results.

The Dog for the Farm.—If a farmer stands in need of a dog, he should have a good one. The farm dog to be a profitable adjunct of the farm should have duties to perform, and should possess certain valuable qualities that will enable him to do his duties well. He should be a faithful watcher of persons and property, and at the same time of a kind disposition. He should be gentle to the live-stock of the farm, and above all, obedient to his master. A good farm dog is a very knowing one.

Pig Labor.—Some one has recommended the pig, as just the creature to work upon the compost heap, and keep it thoroughly stirred up by frequent rooting for stray ears of corn, that are purposely placed in the heap. Swine only pay on the farm, when all their efforts are bent, first towards making a frame, and next to the laying on of fat, and anything that leads them away from this work, is a source of loss. The pig as a farm laborer, to be used for turning the compost heap, is a failure, and the farmer who goes on the principle that pigs may be made "beasts of burden" in the sense of getting profitable work out of them, is, to say the least, not on the right track.

Poll Evil.—This trouble is an abscess at the back of the head where it joins the neck, and is not serious unless it reaches the bones or joints of the neck. The remedy consists in opening the abscess, to allow the accumulated pus to escape, after which the cavity is dressed with a solution of half a dram of Chloride of Zinc, to a quart of water. If the neck becomes stiff before any remedy is applied, the animal is in many cases beyond help.

Summer Day Comforts.—Many of our readers have promptly availed themselves of our proposal, in the June number, to furnish substantial "Hammocks,"—now so popular as summer day comforts,—at a moderate price. We make, of these articles, a special offer for July, which will interest our subscribers and others, and will be found on the last cover page.

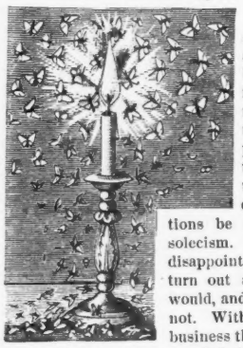
Paper Barrels.—Machines capable of making 200 paper barrels daily are now in operation. Strange as it may seem, barrels for sugar, kerosene oil, lard, and even gun powder, are now made out of a paper pulp.

Stones in the Meadow.—As the knives in the mowing machine strike against the loose stones in the meadow, or become broken by the small ones that get between the guards, they are not pleasant reminders that these obstructions should be removed from the surface of the meadow. There is no better time for doing this, than just after the grass crop has been taken off, while the surface is comparatively bare, and the stones often loosened by the horse rake, and other haying implements. A few hours now spent in gathering up the loose surface stones, will be well spent, and may prevent a serious break to the mowing machine, and that in a hurried time of work.

"A Vine."—"W. S. H." The specimen was nothing but fragments when it reached us; when the plant flowers send again. While sometimes we can *guess* from the leaves only, we never feel sure unless we have the flowers; the fruit is often necessary for determination.

Success with Small Fruits, by Edward P. Roe, New York: Dodd, Mead and Company. This book is phenomenal in every respect. The art of our best artists, and the highest skill of the wood engraver are here made to illustrate such prosaic subjects as grubbing a stony field or to make beautiful and attractive the most stupid and monotonous work of berry picking. The author brings the graces of a style that have given him a place among the popular writers of the day, to tell how berries are grown, picked, and marketed, and quotations from books upon his business desk are more frequent than are those from the books of his library. A large share of the work appeared as a series of articles in "Scribner's Monthly." These are brought together, copiously augmented by other matter, and form a sumptuous volume of over 300 ample pages. The engravings may be regarded as of two kinds, fruits and fruit-growing scenes. In representing the fruits, while a great amount of skill is shown in presenting them artistically, any tendency to exaggeration has been wisely repressed, and they show the varieties at their best without sacrifice of their accuracy as pomological portraits. These are the most important engravings, the others being mere embellishments—and beautiful ones they are. Both the humorous and the sentimental aspects and suggestions of fruit culture have afforded themes to such artists as Homer, Gibson, Sheppard, Mrs. Foote, and others. As to the text of such a work, the author can hardly hope to give much that is new. Its great value consists in its foundation of hard facts. If the facts are not sure, no graces of literature, or charm of illustration can make the book of any value. The title of the work, "Success with Small Fruits" indicates its scope. The author has been successful; he tells the methods which led to that success, and gives instructions that may be safely followed, and gives them in an attractive form, as he well understands the art of "putting things." Not the least interesting portion of the work, and that which has the best claim to novelty, is the description of strawberry culture in the Southern States, and it has also afforded themes for some of the most pleasing pictures. In a work of this kind the author's most difficult task is to give his estimate of the relative value of varieties; he is sure to invite discussion if not make some enemies. If he is a dealer in plants, he is placed in a delicate position, as there are those who are ready to attribute even moderate praise of a variety to a desire to make sales. Fortunately for this author, he has already established a reputation for fairness in this respect, and has been quite as ready to point out the faults of his own seedlings as those of others, and in the present work he has given the opinions of others as well as his own. We may sum up our opinion of this work in two words—Beautiful and Useful. Sent by mail from this office at the publishers' price, $5.00.

Sundry Humbugs.



For once we are disappointed—we were about to write agreeably disappointed, but refrain out of deference to those who hold that the term expresses an impossible condition, and that whoever claims that disappointment can under any conditions be agreeable, commits a solecism. Nevertheless, we *are* disappointed that things did not turn out as we expected they would, and are glad that they did not. With the general revival of business that set in when specie payment became an assured fact, we expected that the large class who get their living by their wits would experience a renewed activity; that the old trade of getting something for nothing would start with new life, and that fraud and swindling would present themselves in new disguises to all the more readily ply their calling. But while honest trade and labor are prosperous, humbugs do not "boom" at all. In all these past years of dullness, in no year, including that of "the panic," has there been such a lack of activity, such an utter dearth of novelty, than

THE LAST FISCAL YEAR—

beginning with July last—has shown, and the last quarter of that year has been marked by a dullness that is almost painful in its intensity. We doubt if in the past 15 years there has been a trimester (as they say at Cornell University) that did not produce some entirely new swindling scheme, or at least an old one so rehabilitated that it was as good as new, except this last. Are we to infer from this that the world is growing better? We wish we could. But we fear that it is only the hush that precedes the outburst of the storm. It must not be inferred from what we have said that no swindling is going on, and that money no longer passes from the pockets of the credulous to those of the sharper who gives no equivalent in return. We refer only to the utter absence of new tricks. Perhaps the most marked feature of the humbug market just at this time is a partial revival of one of the oldest of frauds. The offerers of

THE QUEER, OR COUNTERFEIT MONEY,

were, just after the war, more numerous than any other class of swindlers. In our humbug column of those days it was not rare to give the names of a dozen or more chaps or firms claiming to have bad money which they wished to sell for good. The game flourished for a time, but it was so thoroughly exposed in all parts of the country that it dwindled and finally quite died out. There was a period of a year or two in which we heard nothing of it; then it gradually resuscitated, and of late it has regained some measure of its old-time activity. Indeed, in a budget of letters relating to humbugs, which, considering the season, is quite large, about half relate to this fraud. As this old affair is new to many of our readers, we describe it in brief. If we had a collection of the various circulars that have been sent out in the prosecution of this swindle through all these years, it would be as great a curiosity in the literature, as is

THE ROGUES GALLERY IN THE PORTRAITURE,

of rascality. One of Dickens' characters, Miss Moucher, had a great variety of names for the rouge and other beautifiers she sold to her lady patrons, but the vocabulary of counterfeit money is much larger. Just now the favorite name is "Cigars." The cigar circular is too long to copy in full, but we give sufficient of it to show its style and drift:

"Dear Sir:—My traveling agent, who passed through your section recently, informed me that you were a man of a speculative disposition like myself, and that you were willing to make money rapidly, provided it could be done safely. To come to the point at once, I am a manufacturer of **Cigars** made of Green Tobacco. I am the only person who has been engaged in this business in this vicinity for years. I am not only an expert in the business myself, but I employ none but the best talent in the country to assist me. Everything in connection with my business is as well organized and as well conducted as any business in the land. My **Cigars** though not genuine, are as difficult to detect as anything can be. I presume that you understand me. I do not ask you to send money in advance, nor will I send my goods on credit, as I can sell all I wish to persons for cash. * * * I desire you to come on to the city and examine my stock at your leisure. * * * My prices are as follows:—For $150 I will allow you $1,200; for $250 I will allow you $3,500; for $350 I will allow you $5,500. The sizes of my **Cigars** are Nos. 1, 2, 5 and 10. You will understand I am willing to allow you $300 in goods for your railroad expenses. You are at liberty to bring a friend with you if he has money. But bring a man who can keep a still tongue. If you make up your mind to come, notify me at what hotel you may stop here. If you are not familiar with the name of a suitable hotel here, write to me and I will furnish you all the information you desire. * * * Do not bother me about small orders or samples which are usually sent by mail. An inquisitive postmaster, or some one who is in the habit of getting your mail for you, may be tempted to open your letters. In case you intend coming on immediately notify me three or four days in advance of your starting, so that I can be prepared for you. Read the printed slip inside very carefully. Remember that this circular is sent to very few. * * * It is printed in my private office."

The "printed slip" referred to is a new dodge. The slip, apparently cut from some paper, gives an account of the arrest of a man who had $8,000 in new money in his valise, on suspicion of being a counterfeiter. But the "Cashier of the Third National Bank was sent for, who, after a critical examination of the bills, pronounced them to be genuine"—and the man was discharged. A very neat way that, of showing how excellent was this batch of "cigars." But all do not beat around the bush and have other names;

THEY OFFER COUNTERFEIT MONEY

in their circulars, which set forth its great excellence, and coolly inform the one who receives the document that he has already taken and passed some of the very same bills without knowing it. These circulars, in all their different forms, have a few features in common. They all present the chances of making money rapidly and without risk, in a taking manner. All claim that the senders will act in the most honorable and upright manner, and all warn the one who receives them that the business can not be done through the mails, but only in a personal interview. We can imagine the indignation which our readers, especially those who have not known of the matter, must feel at receiving such a circular, which contains nothing less than a proposition to

BECOME A COUNTERFEITER'S ACCOMPLICE.

It is quite natural that an honest person should feel that he is doing wrong, knowing what he does (or what he thinks he does) in not doing something to bring the rascally maker of the proposal to justice. Some of the letters we receive are quite amusing. The writer usually suggests that we hand the matter to the police authorities, but sometimes one will propose a regular plan for the capture of the counterfeiter and his money, and offers to come to the city for the purpose of putting it into execution. The matter seems to be beyond the reach of the law. If one of the chaps could be detected in selling his "Cigars" or counterfeit money, he could be easily brought up, but in the whole affair, notwithstanding the minute description in the circulars, there is

NO COUNTERFEIT MONEY IN THE CASE.

Among the thousands of such circulars sent monthly to all parts of the country, now and then one will fall into the hands of a person who is ready to make money dishonestly if he can do it without detection, or one of obtuse moral sense who does not consider anything wrong that pays. The sharper arranges the preliminaries with a person, who is to go to a designated third-class hotel and engage a room; he is to have his $100 of good money ready and to receive $1,000 of "Cigars" in exchange. It all works well—buyer pays his good money, and gets his counterfeit in a neat packet. Eager to see his new purchase, he is about to open his parcel, when he is stopped by the other, who tells him that as he came into the hotel below he "saw that there were a couple of detectives on the look-out; I heard some talk about counterfeiters, and I would advise you, with all that counterfeit money in your possession, to be a little careful; I would advise

you to get out as soon as possible, and as our business is done, I'll bid you good evening"—and goes. It is very likely that the thoroughly frightened victim will start for home at once. Sometimes the sharper is so polite that he will see the other safely to the ferry-boat or train. Sooner or later the purchaser inspects his counterfeit money. He finds upon opening it that he has

A PACKET OF NEATLY CUT NEWSPAPERS,

and his good money gone beyond recovery. Enough of transactions of this kind become known, to show that they are of more frequent occurrence than one would suppose. Sometimes a victim is foolish enough to complain to the authorities, but if the victim is a person of any shrewdness he will see that to complain is to expose the fact that he was willing to become a "shover of the queer," which is rogue's slang for passing counterfeit money. This is one of those frauds that can injure no honest person. No one can become its victim without first acknowledging that he is willing to defraud others, and such can get no sympathy from any one....

THE FARMER WHO SIGNED HIS NAME,

this time hails from Pennsylvania. Heretofore he has lived mostly in New England and New York, with a few of him in Michigan and the West; but we do not think we have heard of him in Pennsylvania before. But it is the same old story, only it is not mowing machine sharpeners, or other machinery, but this time it is a Fertilizer. "Two well dressed men of pleasing address, drove up to the house of Mr. Samuel Brown."—These are always in couples, always well dressed, and have pleasing address, and always "drive up" somewhere—how many times have we read it! The "Well-Dressed" represent the Company that makes the Fertilizer. Only a few selected agents are to be appointed in each county. Nothing to pay until the stuff is sold. The "Well Dressed" had inquired among other farmers, and learned that Mr. B. was the proper man to be appointed as agent—Mr. B. thought so too—so it was agreed. The "W. D.," would report to the "Company," and the Fertilizer would be sent.—"As a mere matter of form you know,"—the W. D. had to send in a statement, to show that they had appointed a substantial agent, so out come pen and paper. "How much land have you Mr. B?—and what is it valued at?—Horses?—Cattle?" etc., etc.,—"and not encumbered by any mortgage?"—"Oh no."—There, please look that over Mr. Brown, all correct isn't it?—Please put your name to it as a memorandum—mere matter of form you know."

BROWN GOES AND DOES IT.

The "W. D." go—days and weeks go—Fertilizer don't come, but a note does. It was left for collection—in a distant city, but to oblige Brown, it might be paid at the bank in the village near by. $198.83 is the amount. Brown declares he never signed a note for that amount, and won't pay it. We hope that he won't.....Last month it was silver plated ware, just now

IT IS A SOLID ROLLED GOLD RING,

about which inquiries are made. A party advertises to send for 25 3c. postage stamps, a "Heavy Plain Band Gold Ring," and several have sent us the advertisement, and asked if it does not belong in our Humbug Column. We do not see why. The advertisement offers to send a gold ring for 25 three cent stamps. We see nothing about the advertisement that makes us doubt that the stamps will bring 75 cents worth of Ring. If any one expects to get any more than 75 cents worth of Gold Ring, Red Herring, or Soft Soap for 75 cents, he has lived in this selfish world to little purpose, and is altogether too "child-like and bland," to endure the disappointments that the future has in store for him....In the medical line, all other curative agents are overshadowed by the toys called Electric Batteries. Indeed, we are just now enduring what may be termed

A BOOM OF THE BATTERIES,

and the number increases; new batteries with new claims are offered. We can not say that the later comers claim to do any more than the first ones did, for those would cure *everything*, but these propose to do it in a different way. A few months ago we noticed a Boston Battery which was an improvement on the others, as it drove out disease, and then kept it out by means of a pad, which absorbed it. Now we have another Boston Battery far ahead of the other. This not only sends out disease, but

SENDS IN THE MEDICINE,

for do we not read of "Dr. Rhodes' Electric Transfusing Battery. The only Battery in existence capable of being charged with medicinal properties which can be transfused into the system." This, moreover, differs from other batteries in being worn on the spinal column instead of on the breast. In whatever respect these batteries may differ from one another, they all agree in one particular: each one claims that his is the only useful one, and that all others are of no account. The latest is

PROFESSOR CALDWELL'S MAGNETO GALVANIC,

and the circular setting forth its merits is a remarkable document. There is a picture of a man without any battery, labelled "Before Using," and another picture of a man with a battery, and this is labelled "After Using." Now if these pictures are accurate representations of the man before and after, we protest against its use. One has only to wear one of these things, and his own mother would not know him. A rogue has hereafter no need to go to Canada to escape justice. All he has to do is to wear one of these batteries, and if these pictures are true, he becomes another man altogether. We have already told about Boyd's Battery and his claim that his electricity

"WAS FORMED IN GIMLET SHAPE."

It may do well enough for Boyd, but Caldwell, being a "Professor," has nothing to do with gimlet-pointed lightning. According to Caldwell, electricity is "ejected from the Battery in a circular current, similar to the action of a ball after being shot from a rifle, and enters the system in that shape, twisting and turning until it has spent its force." Uncharitable persons might say that with the exception of substituting a rifle-ball for a gimlet, that this reads just like Boyd's circular. But great geniuses often hit upon the same ideas. Our readers can now have their choice. Those who prefer their's gimlet-pointed will take Boyd's, but if they prefer to have it "twisting and turning" in rifle-ball style, Caldwell's is the battery for them. Sensible people will let all these batteries alone, as the most useless humbugs of the day.

"Pussly."—This plant, which is with some the type of meanness, is known botanically as *Portulaca oleracea*, and is a near relative of the beautiful Portulaca of the flower garden. The range of this weed is a large one, as the following names which it bears in different countries show. In Germany it is known as *Portzelkraut*, in France, *Porcellaine*, and *Pourpier*, in Italy, *Porcellaria*. The spelling of the English name has varied some; as for example, the old English writers have *Porcellaine*, and *Porcelayne*, but with us, while a few say *Purslane*, the name is generally shortened down to simply "Pussly." Whatever the name, or the spelling of the name, of the plant may be, it remains the same rapid growing, plump and low spreading weed, that it was centuries ago, when it was called *Porcella*, the diminutive of *porcus*, a pig, probably on account of its greedy feeding and quick growth. Still it is not all bad. As a weed it is a great promoter of industry; a gardener must be wide awake during the hot weather, or "his 'pussly' will get ahead of him." Its seeds are very pretty when magnified, and as a table vegetable, it is not to be despised. The plump succulent stems with their leaves, are boiled tender, and dressed with butter the same as spinach. The French market gardeners cultivate it regularly, and have different varieties.

Keeping a Record.—A habit of noting the ancestors and date of birth of the larger stock of the farm, even though it be not "full blood," is a useful one. If a record is of so much value for the best stock, it is at least worth the keeping for the good grade cow, or the mixed bred horse. It is often a great convenience to know to what animals a cow in question traces her parentage, and it may be of money value to be able to show the record.

Time to Cut Timber.—July and August are the best months for cutting timber, that it may be the most durable. The growth of the year is now well nigh over, and if the trees are allowed to lie until the green foliage dries upon them, the greater portion of the sap is thereby withdrawn from the wood and the seasoning is rapid and perfect. Cut in mid-summer, insects are much less liable to attack the wood, which is an important point with some kinds of timber like the hickory, etc.

Angora Goat Company.—The Legislature of Virginia, has recently granted a charter for the incorporation of a company, to be known as the "Virginia Angora Company." Up to the present time in this country, the growth of the Angora goat has not been a source of very great income to those thus engaged, but with a considerable demand for the goods made from the hair of this goat, and the admirable adaptation of portions of Virginia to the animal, we may reasonably anticipate a profitable issue to the new impetus given to the Angora goat enterprise.

The Cow Essay.—We wish our readers interested in the keeping of one or more cows—and the list must be a long one—would read the capital essay given on page 270, and see how thoroughly practical it is from the beginning to the end—how full of valuable information in all its parts to the thousands interested in good milk.

How to Use Hen-Manure.—Dry muck, loam, or other earth, will retard or prevent the fermentation and hold the ammonia that is formed. Water enough to keep quite wet will do the same in cool weather. Plaster with enough moisture will also absorb the ammonia, but dry plaster will not. The custom of mixing lime and ashes with hen dung is wrong. They drive out the ammonia instead of holding it. Mouldiness implies, and smell of ammonia (heartshorn) proves, decomposition and loss of ammonia. But the smell of ammonia is extremely pungent, and unless it is very strong, not much loss need be feared. Since the chief fertilizing ingredient of hen dung is nitrogen, and it has so little phosphoric acid and potash, it is rather a stimulating than a lasting manure. Many farmers use it for corn. But nearly all of our experiments (see *American Agriculturist* for March, April, and May) imply that this is poor policy, since corn gets but little help from nitrogen and responds best to phosphoric acid and potash. A little in the hill, however, well mixed with earth, may be very useful to give the crop a start. Hen dung is useful for potatoes, garden vegetables, or indeed almost all crops, including strawberries and other small fruits.

The Horse Fork Neglected.—While the excellent labor-saving machinery for sowing, caring for, and cutting the farm crops, have been very generally appreciated and employed, the means for placing the grass and hay in the barn, have been far too frequently neglected. The improved and almost perfect horse forks have claims upon the farmer, that he is slow to acknowledge. We used to think the hardest work of the haying and harvesting was the "pitching off," but when we put up one of those grappling forks and set it at the work, with a horse as the power, the hard labor was changed into a sort of half sport. The horse fork is one of the great recent inventions, and deserves to take a front rank among those machines that lighten the labor of the farmer, and at the same time allows his work to be done in the most rapid manner in that portion of the season when he is the most hurried and every aid is appreciated.

Cultivated Wheat and Hessian Fly.—It is now a well established fact, that the Hessian Fly is much less troublesome on wheat that is sown in drills, between which the cultivator is passed now and then during the early growth of the grain. Two fields of wheat growing side by side, one of which is cultivated and the other not, but alike in all other respects, seem strong proof of the truth of the above statement.

Red Ants, one of the worst pests of the household, may be trapped by placing a greased plate where the ants can get to it, when in a short time it will be covered with the ants adhering to its sticky surface. The ants may be wiped off and killed, whenever the plate becomes covered, and the trap set for another "catch."

Heavy Pigs.—"A. T. H.," Rensselaer Co., N. Y., seeing a notice of some heavy pigs in the February number, sends an account of others worthy of mention. On March 13th, 1853, Mr. Thomas Hoag, of Tombannock, N. Y., had from a sow of his own breeding, 10 pigs, of which the combined weight was 35 pounds. In looking them over a few days after, he concluded to see what he could make of them. He kept an accurate account of all feed given, except the sour milk from four cows, even charging them for their pasture and the old wood used in cooking their food. On the 15th of December he killed them and sold them in Lansingburgh for $7.50 per hundred weight. The aggregate weight was 4,241 pounds, averaging 424 pounds. The account stand as follows:

DR.

To 10 pigs seven weeks old	$30 00
" 212⅔ bush. corn at 75c.	159 37
" 36 bush. oats at 45c.	16 20
" grinding	14 78
" 13 bush. small potatoes at 12½c.	1 63
" 6 loads pumpkins at $1	6 00
" pasture	3 00
" wood	2 00
Total expenditure	$232 98

CR.

By 4,241 lbs. pork at $7.50 per hundred	$318 07
Balance	$85 09

As you will see, they were only nine months and two days old. They were from the best breed of swine that he could procure in his neighborhood at that time, which was before the era of the large improved breeds. Mr. Hoag proclaimed at that time that whenever his weights were beaten, under like circumstances, he would try again, but he has waited long and has seen the snows of nearly 80 winters, yet he believes he still remains the champion of heavy weights, as he has seen no authenticated report to the contrary.

The Tide of Emigration.—It is an interesting sight to see Castle Garden—which is not a garden, but a great building—filled with new comers from all parts of the world. During the month of April, there were no less than 46,148 emigrants landed, this being the largest number that has ever come to our shore in the same space of time, and this does not include the many that come over in the cabins of the steamers, and go at once to their friends. The emigrants, as a whole, appear to be of the hard working class with but little capital, they mostly go

to the great west, where they will undoubtedly make a working force that will be welcome, and their zeal in seeking a new home appreciated.

Barn Weevils.—These are not, as some suppose, brought into the granary in the wheat. It is an insect that attacks the grain only after it is harvested. A new granary should be so constructed as to afford no crevices to harbor the insect, and the door and other openings should close so tightly at every point that the weevil can not enter, and whatever spaces are to be left open for ventilation must be covered with wire gauze, fine enough to exclude it. In France, the receptacles are often built of sheet-iron. In an old granary, known to be infested by weevils, there is but one safe course, which is to store the grain elsewhere for two years, at the end of which time the weevils will be starved out. "W. K. W.," Lancaster Co., Pa., writes us that in two cases within his knowledge the insects have been starved in this manner. If the wheat is threshed in the barn, care must be taken to leave no scattered grain, and straw is to be stored in the barn only in case it has been thoroughly threshed.

Values of Manures from Feeding Stuffs.—"W. G. L." Mr. Lawes, the famous English experimenter, has calculated the money values of the manures produced from different foods by assuming that certain percentages of nitrogen, phosphoric acid, and potash are consumed and lost, that the rest go into the manure, and that in the manure they have there about the same value, pound for pound, as similar ones in commercial fertilizers in which their value is pretty well settled. Below are Mr. Lawes' valuations of the manure from—

Cotton-seed meal, one ton	$27.86
Linseed cake, one ton	19 72
Beans, one ton	15.73
Wheat bran, one ton	14.59
Clover hay, one ton	9.64
Indian meal, one ton	6.63
Meadow hay, one ton	6.43
Oat straw, one ton	2.90
Potatoes, one ton	1.50
Turnips, one ton	.86

This matter has been much discussed. Dr. Vœlcker considers Mr. Lawes' valuations, in general, from thirty to forty per cent too high, and evidently on good grounds. Of course, the worth of the manure is modified by numerous circumstances. Growing or fattening cattle or milch cows will retain more of the nitrogen, phosphates, etc., from the food and leave less in the manure than store cattle. The waste before the manure gets on to the land varies in different methods of treatment. But nevertheless the figures give a fair idea of the relative values of the manure made from different fodder materials. For farmers in the older States, who buy commercial fertilizers, a deduction of one-third from Mr. Lawes' figures would probably be not far out of the way.

Coal Oil Barrels.—Suggestions as to the cleansing of these continue to come. "B. J. G.," Naples, Iowa, and "M. L.," Lansing, Pa., both advise long continued soaking in water, the idea being that the water enters the pores of the wood and gradually displaces the oil; the first advises sinking the barrel in a stream, the other to set it under the eaves and keep it filled with rain-water. "H. W.," Excelsior, Mo., suggests keeping the barrel full of rain-water, adding the wood-ashes as they are taken from the fire. Neither state how long it will take to remove all traces of oil, and all suggest putting the head that was removed edgewise in the barrel.

Water for a Bath House.—"E. S.," Orange, Tex., asks what would be the cheapest method of pumping and heating water for a bath house. If the water is to be raised from a well, a windmill would be the cheapest. The heating of the water will depend upon the quantity. If much is to be heated, it may be best done in a wooden tank, by means of steam driven into it. If a steam boiler must be put up for heating the water, then in such a case it may be better to have a steam pump to raise the water, and use the exhaust steam for heating.

Millet and Abortion.—"J. R. E.," Somerset, Kansas, writes that it is a general belief in his vicinity that common millet will cause abortion in mares: he has three mares in foal and no other hay, and would know if it is safe to feed it. We do not think it possible for millet to cause abortion directly. When it is cut too late, the bristles that grow near the seeds become dry and hard, and cases have been known in which these bristles had matted together and formed a large ball which ultimately caused death. Should this occur even in a small way in a brood mare, her general health would be affected, as it might be from a score of other causes, and abortion follow at a matter of course.

Raspberries and Blackberries. – W. C. Steele, La Porte, Ind., who has had much experience with both these fruits, prefers to keep the canes much shorter than is usual. He finds that 18 to 20 inches for Raspberries, and 24 to 30 for Blackberries is better than a greater hight. He claims that the bushes are not liable to be blown over, that he gets just as much fruit, and that it is easier to pick, especially if the pickers are children. The stopping should be done when the plants reach the hight named, by merely pinching out the young and tender growing point with the thumb and finger.

Boulders in Oregon.—"C. M. C.," Benton, Oregon. Geologists account for the appearance of such boulders by supposing that at some former period the earth in the locality was covered with ice, and that glaciers, or rivers of ice, were moving, carrying vast amounts of earth, stones, etc., as they are now known to do in the arctic regions and in the Alps. The fact that the stones your mention are very smooth, as if they were polished, gives support to this view of glacial action.

Locusts in West Va.—"W. C. S., Jr.," Volcano, W. Va., writes that this is the year of the appearance of their brood of 17-year Cicada, and that there is scarcely a foot of ground without a hole from which an insect has come out. He finds that the song of the Cicada becomes somewhat monotonous, and compares it to a "ringing in the ears." To our notion its sound is more like that of a threshing machine at work at a distance. We have seen it stated that after their long career in the soil, the insects cease to do mischief, and in the winged state are harmless. This is an error. The female lays her eggs in grooves cut in the small branches of trees; these are often so numerous as to cause the death of the twigs and branches, which, after a time, are broken off by the wind and fall to the ground. They seem to prefer the oaks to other trees, but will deposit their eggs on any others except those of the Pine Family. When they select fruit trees, much damage often results to the orchard.

(*Basket Items continued on page* 285.)

Reform in English Agriculture.

Mr. Caird, an authority on British farming, instead of grieving at American competition, advises the English farmer to make some radical changes in his system, and engage more extensively in the production of those commodities, that do not admit of either long storage, or carriage; such as those of the dairy, market garden, etc. He says in a letter to "The Times," (London):

"The introduction of foreign meat and cereals is of immense benefit to the consuming classes of Europe. American statesmen believe they are rapidly gaining control of this trade, and can maintain it even at lower prices. It must be met by the production here of articles which will not bear long storage or carriage, such as milk, fresh butter, early vegetables, meat, hay, straw, potatoes, and the sugar beet. Grass farms, dairying and market gardening—all the interests in land, whether of the owner, occupier, or laborer—must be disenthralled. The control of the dead hand must be removed. The sale and transfer of land must be simplified and cheapened. Encumbered and unwieldy estates will then be broken up and subdivided to form numerous small properties.

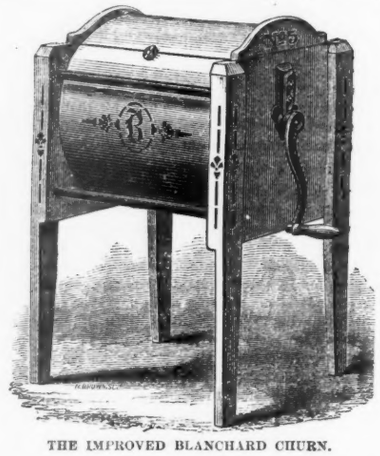
"The drain of agricultural labor and capital to the United States and Canada, which has already commenced and which nothing can prevent from continuing and increasing, will alter the existing conditions of agricultural property in England. Our agriculture must adapt itself to the change, freely accepting the good it brings, and skilfully using the advantages which greater proximity to the best market must always command."—This is a very clear and thoughtful statement of the whole trouble in English agriculture, with a way out of it, that the wise farmer must see is the proper one.

Good vs. Poor Hay. When to Cut Grass.

There are two radical defects in the ordinary practice of growing and harvesting grass and clover. The soil is poorly manured and poorly tilled, and the grass is allowed to get too ripe before it is cut. It is abundantly proved, by actual analyses, that grass grown on land in good condition, is not only larger in quantity, but better in quality, richer in albuminoids, the most valuable food-ingredients, than that grown on poor soil. As to the best time for cutting grass and clover, the experiments described by Prof. Atwater, under the head of "Hungarian Grass," in the present number, coincide with the best data from foreign sources, in implying that early in the time of blossom, or from a little before that to full blossom, is, on the whole, the best period for cutting grass and clover. The hay thus obtained is easily digestible, and has a good percentage of albuminoids. But as it grows older, the proportion of nitrogen decreases, and that of woody fibre grows larger, the hay becomes less digestible, the digested material is poorer because it lacks albuminoids, and finally the hay is not so palatable. For all these reasons, the late cut hay is worth far less for feeding. Timothy and clover grown on rich land, cut early, and well cured, make excellent fodder. Grown on poor soil, and cut late, they are pretty poor stuff. A great deal of the hay that lies in barns throughout the country, is little better in feeding value than good straw.

An Improvement in Churns—The Blanchard.

The churns in common use, operate in two principal methods. In one, the cream is beaten with something, and in the other, something, so to speak, is beaten with the cream. Of the first class are all the various dasher churns, in which agitation is produced by the alternate up and down motion, or the continuous or revolving motion, of a variously shaped piece known as the dasher. In the other set, the something beaten with the cream, is the sides or interior walls of the churn. The cream is dashed against the churn, by revolving a rectangular box, or by giving a similar box a reciprocating swashing motion on an axis, or in a tin cylinder, by means of an oscillating, or pendulum movement. The devices in both classes of churns, for effecting a simple object—the agitation of the cream, are most numerous and varied. The first named class—the dasher churn—is more generally used than any other, and no churn in this class has acquired a wider or higher reputation than the Blanchard. In this there is a revolving dasher, of



THE IMPROVED BLANCHARD CHURN.

such a form—though very simple, that it not only accomplishes the churning with great rapidity and completeness, but allows of the gathering and partial working of the butter before it is removed from the churn. The great claim made by the makers of the various oscillating or swashing churns, in favor of their method is, that the cream is all acted upon equally, and that no portions of it can escape agitation, and be less completely churned than the rest. The Blanchard churn, as originally made, was semi-cylindrical, with a flat top; the small portion of cream thrown against the under-side of the top at the beginning of the operation might, if left there, be imperfectly churned, and if this were mixed with the butter at the close of the operation, that might be streaked or specked. But only a careless dairy woman would leave the cream thus; no matter what kind of churn was in use, a stone-jar, or a Blanchard, a careful butter maker would make sure that the cream was all churned alike, and by scraping down occasionally the small portions that were thrown against the sides, top, etc.,

obviate any trouble from this source. Recognizing the fact that, in their churn as originally constructed, those who tried to do so, could allow a small portion of cream to escape churning, they have modified it so as to make the interior a complete cylinder. The improved Blanchard has a curved top instead of a flat one, and now appears as in the accompanying engraving. We never had the least difficulty in many years use of the churn in its former shape, but as the present form prevents all trouble from unchurned portions in the hands of any one, the change is an improvement. No alteration has been made in the other parts of the churn, and it does not appear that any improvement is possible in these, whether we regard their effective work, or the ease with which they may be taken apart and kept clean, both important features.

The Army Worm—Its Habits.

On the first day of June, Mr. J. N. Plumb, who has a farm at Islip, Long Island, called to say that his grain fields, and those of his neighbors, were being devastated by the Army Worm, and wished to know something of its history, and what remedies had been found useful elsewhere. Knowing that the name was applied to at least three other caterpillars, all of different habits, we requested specimens in order to be sure of the identity of the insect in question. The prompt arrival of specimens of the insect with those of the rye upon which it had been at work, at once settled the fact that *the* Army Worm was upon Long Island in force, and soon after accounts were given in the daily papers. A letter from Mr. J. M. Budd, dated June 4th, announced that the same insect had appeared in force "on the neck lands of Kent Co., Del.;" that some wheat crops were diminished by one half, and asked that we give an article for the future guidance of the farmers in that locality.

Fig. 1.—THE WORM, FULL GROWN.

The earliest recorded appearance of the Army Worm in the Eastern States was in 1743. Next, in 1770, it was present in great force in New Hampshire, and some other parts of New England. Their next serious raid was in 1817, in Eastern New York and Western New England. From that time until 1861 it was not troublesome; in 1875 it appeared in parts of New England and on Long Island, and now, after an unusually brief period, it again parades in the last named locality. During the years since 1861 it has appeared in destructive numbers in several of the Western States, notably in 1861, at which time it extended from New England to Kansas—and in 1875 it visited a large part of Missouri.

We can best serve our readers by giving a condensed description of the insect and its habits. The best history is to be found in Riley's Reports as Entomologist to the State of Missouri: the 2d (1870), the 8th (1876), and the 9th (1877)—that in the 8th being especially full. We may say, in passing, that while the State of Missouri, with a short-sightedness utterly at variance with her former intelligent liberality, has abolished the office of State Entomologist, the country at large is greatly indebted to her for the work already done by Prof. Riley, and his nine Reports contain the most useful information anywhere to be found upon the insects there treated of. The facts and the engravings here given are mainly derived from this excellent source.

Fig. 2. CHRYSALIS.

The Insect Described.

The full grown Worm is of the size shown in fig. 1, and has a general dingy black color; Riley describes its markings thus: "On the back a broad dusky stripe; then a narrow black line; then a narrow white line; then a yellowish stripe; then a narrow sub-obsolete white line; then a dusky stripe; then a narrow white line; then a yellowish stripe; then a sub-obsolete white line; belly, obscure green." The head is pale grayish yellow. When

Fig. 3.—THE MOTH, NATURAL SIZE.

full grown they suddenly disappear; they enter the earth, form a cavity a few inches below the surface and change to the chrysalis (fig. 2), "of a shining mahogany brown color, with two stiff converging thorns at the extremity, having two fine curled hooks at each side of them." In two or three weeks the changes are complete, and the perfect insect appears as a moth, given of the natural size in fig. 3. The general color of the moth is light-reddish brown or fawn color, this is sprinkled with minute blackish atoms or spots; there is a dusky line running inwardly from the tips of the front wings. Near the center of these wings, towards their upper margin, is a white spot, which allows the moth to be distinguished from others, and from which it derives its specific name, the insect being known to entomologists as *Leucania unipuncta*.

How Does it Pass the Winter?

Many, indeed the majority of moths are short-lived; depositing their eggs soon after they issue from the chrysalis, their career is completed and they die. With the moth of the Army Worm, Prof. Riley found the eggs very immature when it was some weeks old, and his observations lead to the conclusion that it does not deposit its eggs until the following spring, but in the fall finds some crevice in which to bide itself to pass the winter. The same naturalist thinks that some of the insects pass the winter in the ground in the chrysalis state, especially in northern localities. The moths, after their winter's rest, appear in the spring soon after vegetation starts, and deposit their eggs in April. The eggs are opaque, white, spherical, and $^{2}/_{100}$ inch in diameter; these are deposited in clusters of 5 to 20 upon the stems of grass, or rather along the base of the uppermost leaf of the grass stem, and glued in place. The eggs hatch in 8 or 10 days, and the minute, newly hatched insect is white. The caterpillar, during its early life, is greenish and not noticeable; it is only when it has changed its skin several times that it begins to show the characteristic markings that distinguish the full-grown worm.

What It Feeds Upon.

Such, in brief, is the history of the insect from the egg around to the egg again. Its natural food is the coarse wild grasses; among cultivated grasses they are most fond of timothy and blue-grass; clover they do not like; wheat they are especially fond of, more so than of rye, though they will eat that, as they will a variety of other plants when pushed. The preference of wheat for rye was manifested by the worm in Missouri. Since this was in type, Mr. Plumb has informed us that the preferences of the Long Island insect are exactly the reverse, and that it greatly prefers rye to wheat, which it will leave if rye is near by. Accounts from Delaware state that there wheat is the crop most injured. The insect will attack corn, but not potatoes or pumpkins. Hogs, chickens, and other poultry devour vast numbers of the worms, as do the wild birds and other animals. Hogs are said to have eaten so greedily of them as to die in consequence. Like most other insects, these have their insect enemies, both cannibals, which destroy the young larvæ, and those which themselves pass their larval state within the bodies of the larger caterpillar or Army Worm. Such parasites work unnoticed, save by the few naturalists who study their habits, but they render important service in keeping these and other destructive insects in check. In Army Worm years the worms are not noticed during their early life; and it is only when, after having destroyed the grass on the field where they were bred, they start out in search of food, that they become formidable. Their course in one direction, taken by all through some mysterious common impulse, is held with remarkable tenacity. If shallow water is met, the advance fall in until their dead bodies form a bridge for the living ones to cross.

Methods of Destroying the Worm.

Upon a road or upon a fairly level field large numbers of the worms can be killed by the use of a roller. Crude petroleum has been suggested, and we have no doubt that vast numbers might be killed by watering a strip, especially where they would cross a road, with this. The worms in crossing a belt of the petroleum would probably get sufficient upon their bodies to kill them. Another method is to poison a strip of grass in their path with London Purple or Paris Green, in the same manner as potatoes are dosed for the Potato-Bug. To save a field of grain from their attacks the most effective method is to make a trench by plowing, running two or three times in the furrow, with the straight side towards the field. When a large number of the worms are collected in the trench, straw may be strewn along it and set on fire; the heat not only kills the insects, but keeps the side of the trench dry and crumbly, and prevent them from climbing it. If a heavy rain should wash the side of the trench, it must be mended or a new one plowed. It has been suggested to dig pits or small wells in the bottom of the trench at intervals; the insects in going along the trench in search of a place to ascend the side, will fall into the pits and be trapped in large numbers; when the first set of these pits is nearly full, other pits are dug, throwing the earth into the first ones to kill the worms. It has also been suggested to feed the worms in the trench with freshly cut grass that has been thoroughly sprinkled with London Purple or Paris Green. It may be some satisfaction to those who have suffered from the visitation of the insect, to know that two successive Army Worm years have never been known in any one locality, and it is not thought that such can occur. They are with us more or less every year, but it is only when conditions favor an unusually abundant crop of them that they become troublesome. It has been observed that the worm usually appears in wet springs that have been preceded by one or more very dry years. As to the time of their appearing, that is, in destructive force, it is found in the different localities to correspond very closely with the period at which the wheat is in "the milk."

Experience with Barbed Fence.

C. L. Sanborn, Sup't. of "Sawyer's Ranch," Silver Lake, Kansas, writes to the *American Agriculturist:* "I have been very much interested in the various articles on 'Fences and Fencing,' and, as requested, will give you our experience with wire fence. Within the last year we have built eighteen miles of *wire* fence, using both plain and barbed wire. We have seven miles built of two-barbed, one plain wire, and board at top. This makes a very good fence, but we now think the board should be between the barbed wires. We have three miles of fence composed of four plain wires, one foot apart, the two middle ones being barbed *after* putting up. This fence we do not like, as the barbs slip on the wire, and stock will slip through. Another three miles is built of three-barbed wires, 16 inches apart. This makes a good fence for large stock, but for yearlings and calves the wires should be nearer together. The best fence we have is built of three steel-barbed wires, bottom one 18 inches from the ground, the others a foot apart. For posts we use wood—cedar, oak, black walnut and elm—which we set in the ground two feet, and 8 to 20 feet apart. Oak posts are liked best, as they hold the staples more firmly. We have used the 'Glidden' Steel Barbed, the 'Steel Barbed Cable' Fence, the 'Ohio Steel Barbed,' and 'Lyman Manu'fg Co. Barbed Fence,' and now give preference to the last named.—We never have had stock of any kind injured from running into the wires. In fact cattle will have nothing to do with a good steel barb.—Our fence costs from 50 cts. to $1 per rod. Posts cost 10 to 14 cts. each.—The fence we have built

encloses a stock farm or 'ranch' of 3,000 acres, and we consider steel-barbed wire fence, with oak or iron posts, the best fence for Kansas.—In putting up the fence, we run the wire off from the spools, from a wagon, stretching from a half to a mile at a time, with blocks and tackle. Corner posts should be well braced. The best plan is to bore two holes in the bottom of the post, and drive two-inch sticks through (as shown in the sketch, fig. 37). These posts, well put into the ground, and braced from the top wire, can not be pulled over."—[In fig. 38 we suggest a simple method of bracing corner or stretching posts which will frequently be convenient. At a distance of 4 to 6 feet drive a short stake of a length required by a loose or compact soil. From this extend a short wire, or a double one, to the post. Where there is much strain, this wire will need to be heavy, or it will break or stretch. If needed, a bracing wire may be put on each side, as shown in the engraving, fig. 38. These short stakes will not be in the way, as they will be directly under the running fence. The horizontal wires may

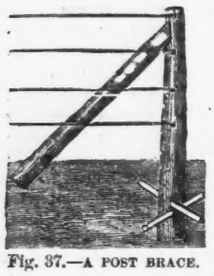


Fig. 37.—A POST BRACE.

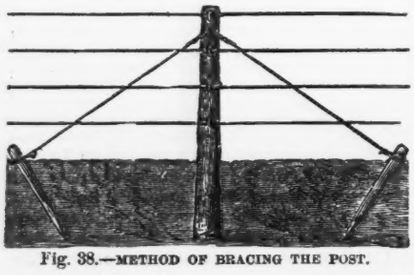


Fig. 38.—METHOD OF BRACING THE POST.

be given one turn around the post, and a staple driven to prevent slipping up or down, or they may be put through a hole bored in the post and securely fastened by driving in a spike or large nail. Ed.]

R. A. Steele, of Douglas Co., Kansas, writes to the *American Agriculturist:* "I have been using barbed-wire for the past year; was previously prejudiced against it; have now over one mile—three wires, with posts one rod apart. It answers the purpose; that is, it turns stock. I had in pasture over 200 Colorado cattle, last year, 'stampeders,' and they broke the fence once only. Stone-wall is the fence for this region; costs $1.25 per rod, and turns hogs, etc. We consider barbed-wire fence, when properly constructed, safe, but not so cheap as stone.—My plan in putting up wire is: posts one rod apart, every tenth post to be well set, to strain the wire. Use a clamp around the wire attached to a lever; fasten to the first post, and roll out to the tenth post, apply the lever, and draw the first wire, which should be the lower one, the tightest (no team can equal this way); put the remaining ones on the same way, but not quite so tightly. It will not do to tack wire on to trees, unless you first nail on a strip or board, which will save the wire from rusting and breaking, as it would do in a few years. I have seen this tried, and it is no theory.—In a word, poorly constructed fences are the ones which usually cripple and maim stock. I would recommend the posts not over ten feet apart. Where timber is scarce, plant an osage orange between the posts, and let them grow to make a small tree, and when of sufficient size, saw off say five feet from the ground, nail on a strip to fasten the wire to, and you have a post which will last. This is the only use I would have for osage orange. I prefer the four-barbed rather short; the long ones cut severely. I have no interest in any particular wire, but have my preference, and my object in writing to you is, this wire fence is bound to be the rage, and for certain localities, will be the only fence, provided they can suspend it in the air; but for a large portion of Kansas, stone is so convenient that it is far cheaper; the only thing is time. With stone fence we can let hogs run, which is a great consideration. Six wires may turn hogs, but I doubt it—that is those that are quite small."

More About the Army Worm.

The appearance of the Army Worm in several eastern localities has caused no little excitement; the daily papers have had articles, some of them more or less sensational, and the inquiries made of us both in person and by letter show a general desire for information concerning this pest. A condensed history of the insect will be found on another page. After that article was in type we received from Mr. J. N. Plumb copious notes of his observations of the insect, and its habits, and a very full account of his battle with the "Army," in his attempts to save certain crops from destruction. "Deer Range" farm, Mr. Plumb's place near Islip, L. I., enjoys the distinction of having been the first locality on Long Island, visited by the worm—or at any rate, the first on which it was noticed. To publish Mr. Plumb's article entire would be to repeat much that is given in the article referred to; we only give points which are not already stated.

How they Move.

"The Army Worm is still working north and west, and seems to have no inclination to go east—the dividing line of their destructive work is so marked, and well defined, that at a distance of 10 feet to the east—without any barrier to prevent—not one worm can be found. In the potato field which lays along the 40 acres of rye, they have never gone east further than the tenth row.

"Their Favorite Food

seems to be rye, corn, red-top, and timothy, especially the two latter. It is the impression of my manager, Mr. Jarvis H. Smith, that they will attack and eat wheat if in the line of their march. They prefer rye and will leave the former for the latter if near by. Any kind of grass they will devour—if they can find any green and tender to feed on near by—but when everything else is consumed, they will go back on to the clover and make clean work of it.

Crops May be Saved.

"Directly north of the destroyed rye field, separated by an avenue two rods wide, is a field of 21 acres of corn now eight inches high. All our energies were directed to keeping them out of this field, and a large field of potatoes adjoining, as they were directly in their march to the north. It has been a hard week's fight, as all hands here know, but we have succeeded thus far in saving those two crops.

Attempts to Stop Them.

"We dug deep trenches, used Lime, Salt, Paris Green, Tar, set fire to the grass, and where there was no grass, carted hay, etc., and set fire to it in windrows, and with a large staff of men could not head them off; nothing would stop them. They had got the start of us, were headed west and bound to go west, and when the ground was hot and scorched after burning the grass, they marched right along over their dead and dying comrades that went before, stopping for nothing. My son set fire to the grass when they were crossing and they marched fearlessly right up to the very edge of the burning grass, never turned back, but as they shrivelled, others walked over them and while the ground was hot and smoking on they came.

Success in Poisoning.

"As for trenches or deep furrows we found them of no protection of themselves. But we finally conceived the idea (after burning hay, sprinkling lime and tar in these trenches without avail) to put in these trenches, their favorite food for them to eat—viz. red-top grass. This grass we wet with a mixture of Paris Green, the same that we use for potato bugs. And as long as the grass remains green and fresh they will remain quietly in the trench and feed on it and it kills them by millions, but as soon as the grass gets dry they stop eating it and then go out of the ditch if they can. (London Purple has the same effect as Paris Green). From this time forth we shall adopt this plan as the most effective; killing more and with less labor.

When they Feed.

"Our experience is—and we have studied their movements very closely—that their principal feeding time is from 11 A.M. until sundown. At 3 P.M. they seem to be more numerous than any other hour of the day. Early in the morning scarcely any are to be seen; they are then in companies of 25 to 50 secreted in the sods, tufts of grass, roots, clumps, or wherever they can get protection or shelter. As soon as the sun comes out warm they begin to move, the companies form in line and the march goes on. They never fail in discipline, never encroach upon the rights of each other—and in feeding are careful not to crowd each other and never contend for the same blade of grass. It is rare to find more than one on a stalk of grain. We are satisfied they do not feed or travel much at night as I went out at 1 o'clock A.M. with a large reflecting lantern, and after a careful inspection found but few on the stalks of grain. They were on the ground and did not seem to be feeding any, and but few were travelling." A day or two later Mr. Plumb sent us another report from the "seat of war," from which we extract the following concerning the

The Use of Trenches.

"In reference to trenches, ditches, or deep furrows to head them off, I would say that a ditch or trench is of no avail if after it is made it is left to itself. It must be constantly watched by men or boys, walking up and down along the trench, and sweeping back the worms as they crawl out, but the plan you sent me we found the best of all the methods we tried (and we have tried everything that ingenuity and energy could devise) and that was to dig pits every rod or so in the bottom of the trench. In this way we have caught and destroyed untold millions. The worms in their determination to go north approach the trench and go or fall into it. Then they attempt to go out on the opposite side—finding it not easy they, after several efforts, work along the trench in the endeavor to find an opening, and in doing so fall into the pits arranged along the bottom of the trench and which we dug about 2 feet deep and a foot or more square, with straight, clean shaved sides. In this way we have in a few hours time reduced the rank and file of the Army Worm in fearful numbers, and is *the only plan* I have any confidence in. Plowing a furrow is of no avail or use whatever in checking the progress of the Army, if, after plowing, a spade is not used to deepen and throw out the loose dirt at the bottom and sides; but on a big farm this is costly work."

Science Applied to Farming—LVIII.

Hungarian Grass and Hay.

I have received inquiries from a number of States, concerning the composition and nutritive value of Hungarian Grass. Some analyses and comments bearing upon the question, were published in the "Report of Work of the Middletown, Conn., Experiment Station, 1877-8," but as the circulation of this was limited, an outline of the results may be in place here. The samples analyzed were from Arawana Farm, Middletown, and kindly furnished by its proprietor, Dr. J. W. Alsop, with the following descriptions.

SOIL.—Low land, gravelly loam, stony, clay subsoil, wet in spring. Had been unbroken pasture for at least twenty years, until fall of 1874, when it was under-drained three feet deep, (drains forty feet apart), and plowed. In 1875 had roots in drills, with a liberal supply of barn-yard manure.

CROP.—In first week of June, 1876, sowed to Hungarian grass, applying the Stockbridge formula for Hungarian for one ton. Crop cut July 17, 1876. Yield about 3,300 lbs. of Hungarian hay per acre.

SUBSEQUENT TREATMENT AND YIELD.—Pastured until Aug. 18, 1876, then plowed and seeded with herd's grass, red-top, and clover, with dressing of 200 lbs. of blood guano per acre. In 1877 cut from the three acres, three roods, and twenty-seven rods, nine loads of hay, averaging fully one ton per load, and two loads of clover rowen. In 1878 cut eleven loads of hay and three loads of rowen. The samples for analysis were taken from plots of 49 to 87½ square feet area, as follows:

No. I. Cut July 17, 1876. Heads partly filled; seeds little developed; stalks averaged about twenty inches long.

No. II. Cut Aug. 3d. Heads well developed and well-filled with seeds; seeds soft; hay rather

yellow; stalks averaged about twenty-six inches long.

No. III. Cut Aug. 18th. Nearly ripe. Heads well-filled, seeds falling out; hay coarse and yellow like straw; stalks some thirty inches long.

The yields per acre of the freshly-cut grass, cured hay, and dry (water-free) substance, as calculated from the yield on the small plots, which of course do not represent what would be the produce per acre, were as follows:

No.	Green Fodder.	Cured Hay.	Dry Substance.
I.	July 17, 1876....20,740	July 29, 1876....5,876	4,509
II.	Aug. 3, " 16,891	Aug. 12, " 6,111	4,773
III.	Aug. 18, " 10,454	Aug. 25, " 4,014	3,121

The percentages of water in the freshly-cut grass, were: I, 78.3; II, 71.7; III, 70.2; in the freshly-cured hay: I, 23.2; II, 21.9; III, 22.3. On standing, they dried down still more. The crop on the whole field, 3,300 lbs. per acre, cut July 17th, would be, per figures of I, assuming 75 per cent of water in the grass, and 23 per cent in the freshly-cured hay:

Green Weight, @ 75 per cent Water.	Cured Hay. @ 23 per cent Water.	Dry Substance.
10,164 lbs.	3,300 lbs.	2,541 lbs.

The Composition of Hungarian Grass & Hay.

Analyses of the samples at our laboratory gave results as in the table below, in which I add German analyses by Moser and Metzdorf.

HUNGARIAN GRASS AND HAY.	Water.	Ash.	Albuminoids.	Woody Fibre.	Carbohydrates.	Fat.
GRASS.—GREEN FODDER.						
Dr. Alsop's.						
Cut. Hight. Development.	*p.ct*	*p.ct*	*p.ct*	*p.ct*	*p.ct*	*p.ct*
I. July 17, 18-26 in., in blossom...	75.0	2.2	3.2	8.7	10.4	0.6
II. Aug. 3, 24-34 in., Out of blos'm	70.0	1.5	2.9	9.9	15.0	0.6
III. Aug. 18, 32-40 in., Nearly ripe...	70.0	1.9	2.1	10.4	15.0	0.6
German (later sown.)						
July 8, 3-4 in.....	80.6	2.5	4.9	4.6	7.10	
July 21, 8-10 in.....	78.7	2.5	5.3	5.5	8.06	
Aug. 10, 15-16 in.....	69.9	2.4	5.9	9.4	12.5	
Aug. 24, 18-24 in.. In blossom...	65.6	2.3	5.9	11.3	15.0	
Sept. 7, ... After blos'm.	62.9	2.4	5.8	11.5	17.4	
HAY.						
Dr. Alsop's						
I. July 17, In blossom.....	16.7	7.2	10.7	28.9	34.5	2.0
II. Aug. 3, After blossom.....	16.7	4.3	8.0	27.6	41.7	1.7
III. Aug. 18, Nearly ripe.....	16.7	5.3	5.7	29.9	41.7	1.6
German (later sown.)						
Aug. 10,.....						
Aug. 24, In blossom.....	12.5	5.8	14.9	28.5	38.0	
Sept. 7, After blossom	12.5	5.5	13.6	27.3	41.1	

Calculated in the manner described in the *American Agriculturist* for last December, page 497, and January, page 9, the digestibility and feeding values of Dr. Alsop's Hungarian compare with European products, and with similar ones as analyzed in this country, are given below as follows:

Feeding values of Hungarian and other Hays.

HUNGARIAN AND OTHER GRASSES AND HAYS. A., Dr. Alsop's. M., Other samples analyzed at Middletown. W., German from Wolff's Tables.	DIGESTIBLE NUTRIENTS. Albuminoids.	Carbohydrates.	Fats.	Nutritive Ratio.	MONEY VALUE. Dollars per 100 pounds.	Comparison with medium Hay=100.
GREEN FODDER.	*p.ct*	*p.ct*	*p.ct*	1:	$	
Hungarian Grass, in bloss'm, W	1.8	11.8	0.3	7.0	0.19	0.30
Hungarian Grass, in bloss'm, A	1.8	11.5	0.2	6.7	0.19	0.30
Hungarian Grass, nearly out of blossom, A.....	1.2	11.0	0.2	9.4	0.16	0.25
Timothy Grass, in blossom, W..	2.1	16.0	0.5	8.2	0.28	0.42
Clover Grass, in blossom, W....	1.7	8.7	0.4	5.7	0.17	0.26
Rich Pasture Grass, W.....	3.4	10.9	0.6	3.6	0.27	0.42
Fodder Corn, So. White—young.	0.9	7.6	0.1	9.2	0.11	0.17
HAY.						
Hungarian Hay, in blossom, W.	6.1	41.0	0.9	7.1	0.67	1.03
Hungarian Hay, in blossom, A..	6.0	38.3	0.8	6.7	0.64	1.00
Hungarian Hay, nearly out of blossom, A.....	4.0	36.7	0.5	9.4	0.52	0.81
Hungarian Hay, nearly ripe, A..	2.8	37.5	0.5	14.0	0.48	0.75
Timothy Hay, medium, W.....	5.8	43.4	1.4	8.1	0.69	1.09
Timothy Hay, just head'd out, M	4.4	43.6	0.8	10.4	0.62	0.97
Timothy in full blossom, M.....	3.1	39.9	0.5	13.2	0.52	0.81
Meadow Hay, average, W.....	5.4	41.0	1.0	8.0	0.64	1.00
Clover Hay, average, W.....	7.0	38.1	1.2	5.9	0.69	1.08
Clover Hay, just bef. blos'm, M.	6.7	38.8	0.8	6.1	0.67	1.05

It appears that Dr. Alsop's Hungarian grass cut in blossom agrees exactly with Wolff's average for German, both being reckoned on basis of 75 per cent of water. Dr. Alsop's hay in the table falls a trifle below the German. This is because it is reckoned on basis of 16.7 per cent, one-sixth, of water, whereas Wolff assumes only 13.4 per cent. Like other grasses, the Hungarian as it grows older has less albuminoids and more woody fibre. At the same time, it becomes less digestible. The Hungarian hay, No. II, is worth about one-fourth less, pound for pound, according to the calculation, than No. I.

The youngest hay, with one pound of digestible albuminoids to 6.7 lbs. of carbohydrates is a good fodder, but the old hay, No. III., which has only one pound albuminoids to 14 of carbohydrates, is poor; it lacks material to make flesh, fat, and milk. Dr. Alsop's Hungarian hay, cut in blossom, is just about equal to the average German meadow hay (English grasses), which is equivalent to saying it is decidedly better than average upland hay with us, as may be seen from the analyses of American hays, (M. M.) in the table. Our hay suffers in comparison with theirs, because we do not manure or till our land so well, and often cut our grass late. For these reasons much of the hay cut on our old meadows is little better than good straw.

Dr. Alsop's crop of Hungarian was not large. Cut early in blossom, the yield on the whole field fell short of two tons of hay per acre. But it made excellent fodder, and the land was in good condition, so that in the two succeeding seasons, it brought six tons of good hay and rowen, and promises to continue to do well for some time to come. Let us now consider the matter of

Hungarian in General.

Those who know the most about Hungarian grass, ascribe to it two chief peculiarities, deep rooting and rapid growth. Being a deep feeder it stands drouth, and often brings very large crops in soils and seasons where other grasses would fail. It requires, however, a rather loose soil with not too compact sub-soil, doing best on sandy loams and the like. Humus and lime are said to be favorable to its growth. The soil should be deeply plowed and well tilled. On account of its deep feeding Hungarian is said to exhaust the upper layers of the soil less than other grasses. It does particularly well on newly broken land or after a hoed crop like corn, potatoes, or roots. Being a rapid grower, fresh dung is said not to be so good for it as well rotted manure or concentrated fertilizers. It wants a good supply of available food in the soil. It may be sown at any time from May to August, its rapid growth permitting it to be cut early and cleared away for a fall crop, or sown late to piece out the scanty fodder of a dry summer or fall. Cattle are said not to relish it so well when cut too young. At the same time if it stands too long it becomes coarse, strawy, and indigestible. I have no data at hand to show how large crops are generally obtained with us. European figures put the yield at from 2 to 3½ tons per acre. Those who have used Hungarian Grass, speak very highly of its qualities for feeding. W. O. ATWATER.

The Onion Fly (*Anthomyia Ceparum*).

The onion growers are again complaining of serious trouble from a fly, not a new comer, which lays its eggs upon the leaves of the onion. The eggs

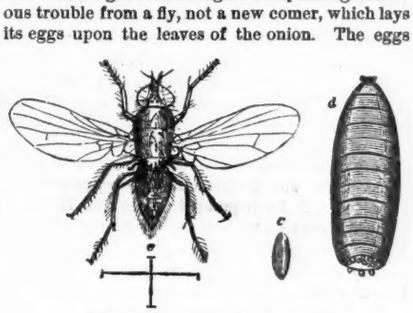


Fig. 1.—THE FLY AND PUPA.

thus deposited hatch in a few days, and the larvæ or maggots immediately penetrate between the leaves of the growing plant, and begin their work of feeding and reducing the interior of the onion to a worm-eaten and worthless state. The maggots remain in the onion about two weeks, when they change into the pupa or dormant state, from which they emerge after 15 or 20 days as the perfect fly, prepared to deposit eggs upon other onion plants, and thus continue the destructive work. The perfect fly, which is about half the size of the common house fly, is shown in figure 1, *e*, somewhat magnified; *c* shows the pupa of natural size, and *d* the same enlarged. The larva of this insect is shown of its natural size, *a*, and magnified at *b*, in figure 2. The insect is difficult to destroy. The use of salt, ashes, and other substances, strewn upon the soil, seem to do very little good. When a plant is once affected by the maggot, it should be pulled up and burned. The presence of the destroyer is early known by the leaves of the plant turning yellow and falling upon the ground. Onions on new soil are less liable to attacks than those on old onion ground. All affected plants should be destroyed, whether few or many, as it is only by this method that the increase of the insect may be checked.

Fig. 2.
THE "WORM."

A Country House, Costing $3,500.

BY S. B. REED, ARCHITECT.

The designs here given, represent a substantial and roomy dwelling, suitable to the wants of well-to-do farmers, and others residing in the country.

Fig. 1.—FRONT ELEVATION OF HOUSE.

Exterior.—(figs. 1 and 2, see following page). The outlines are irregular and proportionate. Each face has sufficient diversity in projections, and details to give an animated and picturesque appearance. The roofs and gables are treated in a simple manner, to accord with good taste and rural surroundings.....The **Front,** (fig. 1), has a breadth of 35 feet, across which extends a shady veranda, covering the main entrance, and the front parlor window; there is also a pleasant balcony, covering the front sitting room window. The side, (fig. 2), has an extreme depth of 63 feet. A porch protects the entrance to the kitchen from this side. The rear entrance to the main house is on the opposite side of the house.....**Cellar** (fig. 3). Hight, 6½ feet. This story includes the entire space below the main house, giving plenty of cellar room for all usual requirements. The outside entrance is from the rear, and a stairway leads to the kitchen.... **First Story** (fig. 4).—Hight of ceiling, 10 feet. The principal entrance is from the veranda through double front, and vestibule doors, to the main hall. This hall communicates with each of the principal rooms on this floor of the main house. The parlor doors are double, and directly opposite

to them is a sash door opening to the balcony. At the rear end of the hall is an entry through which the rear stoop is reached. The Parlor and Library adjoin each other through sliding doors, and may be used as one room as occasion may require; each is well lighted, and are sufficiently separated from the living rooms to prevent annoyance in them from the machinery of general house-work. The Sitting-room is a cheerful apartment, with an open fireplace suited to a grate on the hall side, and a large bay window opposite. A front window is arranged with a swinging panel below the sash opening to the floor, and leading to the balcony; opposite to it is a door leading to the dining-room. The Dining-room is octagonally shaped and of good dimensions. It has a large bay window with four full sized sashes extending upward to the ceiling, and containing upper ventilating sashes with stained glass, as can be better seen in elevation, figure 2. This window is a pleasant feature, and with the addition of a double row of brackets, and potted flowers, may be made to serve acceptably as a substitute for a conservatory. Direct communication is arranged from this room with the kitchen, pantry, china closet, and the rear entry. The Kitchen is conveniently arranged with a large open fireplace suited to a range, four windows give ample light from three of its sides; it has doors leading to the dining-room, pantry, closet, outside porch, and to the private stairs leading to the second story. A pump, sink, and three wash-tubs are set at the sides of the fireplace. The Pantry is thoroughly shelved, and one side dresser-finished with sash doors above and drawers below. The Cellar Stair-way is situated under the private stairs, and is made to open from the pantry....

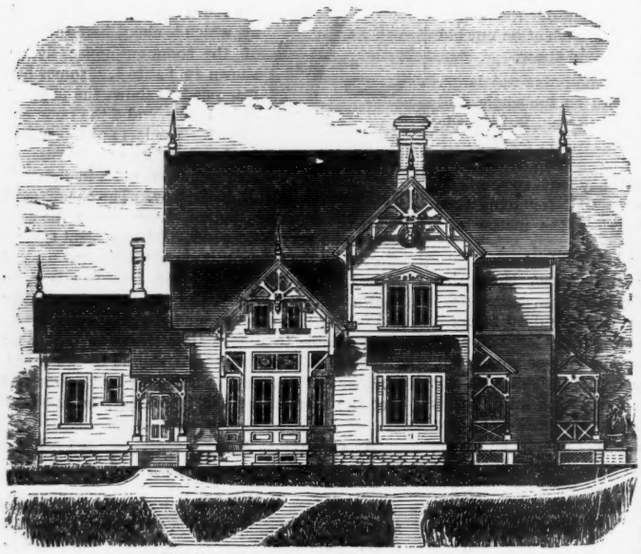


Fig. 2.—SIDE ELEVATION OF THE HOUSE.

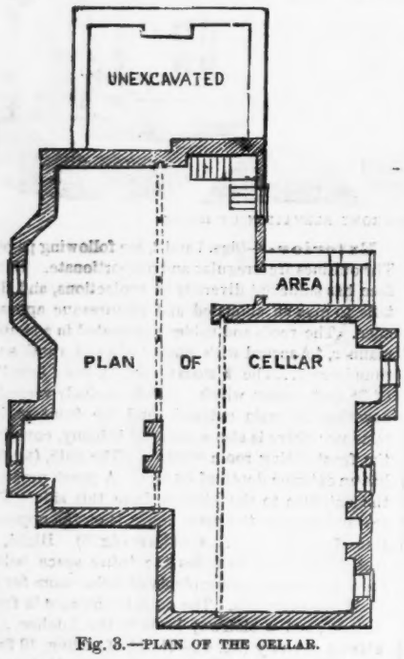


Fig. 3.—PLAN OF THE CELLAR.

Second Story (fig. 5).—Hight of ceiling, 9 feet in the main house, and 4 to 8 feet in the rear section. The hall is central, and convenient to the principal chambers, front bed-room, and connects with the rear passage. Each of the principal chambers is large, and has window openings on two of its sides. The rear passage is lighted from a dormer window, and through a sash door this light is transmitted to the main hall. The passage leads to two chambers, a store room, and by the private stairs to the kitchen. All communication between the rear section and the main house in this story, may be cut off by closing the sash door at the end of the main hall.... **Attic.**—Space for storage, etc., is made under the roof of the main house. It is floored, and has windows in the gables, but otherwise unfinished. The stairs are placed above the main flight, boxed in, and have a door at the foot. .... **Construction.**—The Foundations are of broken stone and mortar, 1½ foot thick, except where reduced for the stair-way, and are finished to show 2½ feet above the earth grades. For the unexcavated part they extend in the ground below the reach of frost, and have openings in them sufficient to insure ventilation beneath the kitchen floor. The area steps, and coping, and the sills for the cellar windows are of blue stone. The cellar windows are made to swing inside and upwards, and are held open as required by being hooked to the beams above. The Chimneys are of hard brick and mortar, with tops laid in cement. The main frame is of sawed timber thoroughly framed. The inclosing is of double boarding—first with 10-inch sheathing of even thickness, then with 6-inch clear pine clapboards. The roofing is of the best quality of 18-inch pine shingles, and for the principal parts are laid on spruce lath. The valleys, gutters, and leaders are of IX charcoal tin. The inside flooring is of 8-inch spruce, outside of 4½-inch pine. Plastering, hard-finish on two coats of best brown mortar, and seasoned lath, with neat stucco cornices are put in the principal rooms. The principal finish in the gables and verandas, is of timber neatly stop-chamfered, and fitted together. The rafters of the latter are left exposed to sight, with the roof-planking laid face down and beaded, complete for painting. Lattice panels are put under the veranda floors, as shown in fig. 1. The sash and doors are all of "stock sizes," 1⅛ inch thick, glazed with second quality of sheet glass, and in the two main stories are hung to weights with best cord. All windows in the first story of the main house have panels under them. The doors are of first quality pine, panelled and molded. A force pump is placed at the end of the kitchen sink to throw water into a tank placed under the kitchen roof, and from thence pipes carry water to the sink, and wash tubs.—Painting is two coats of best materials in shades to suit. The following **Estimate** is made at the uniform standard of prices given in previous months, and though differing somewhat from "prices current," will greatly aid in making calculations, especially as to the quantities of materials to use:

225 yards Excavation, at 25c. per yard	$ 56 25
75 perches Stone-work (complete), at $2.75 per perch	206 25
6,000 Brick in Chimneys (complete) at $12 per M	72 00
60 feet Stone, (Sills, Steps, etc.) at 12c. per foot	7 20
900 yards Plastering (complete), at 25c. per yard	225 00
350 feet Stucco Cornices and Centres (complete) at 25c. per foot	82 50
7,500 feet Timber, at $15.00 per M	112 50
200 Joist, 15c. each, $30; 400 Wall Strips, 12c. each, $48	78 00
500 Shingling Lath, at 6c. each	30 00
90 bunches Shingles, at $1.25 per bunch	112 50
Cornice Materials	80 00

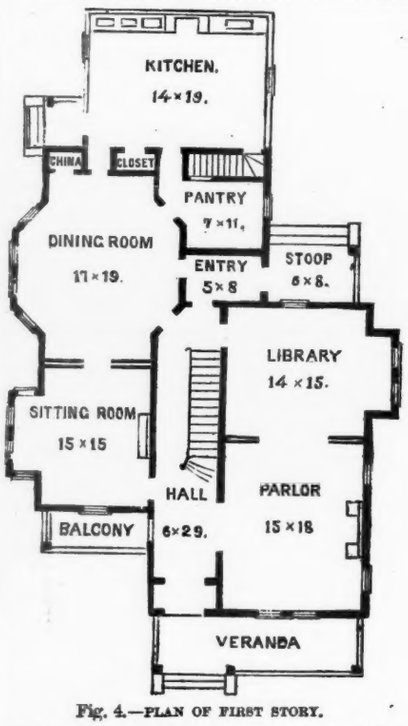


Fig. 4.—PLAN OF FIRST STORY.

400 ft. Ties, Valleys, Gutters and Leaders, at 8c. per ft	32 00
380 Sheathing, (10), at 25c. each	95 00
775 Clap-boards (6), at 12c. each	93 00
160 Flooring (outside), (4¼), at 25c. each	40 00
500 Flooring (inside), (8), at 28c. each	140 00
6 Windows, cellar, (complete), at $3 each	18 00
38 Windows, plain, (complete), at $8 each	304 00
38 Doors (complete), at $8 each	304 00
Verandas and Porches (complete)	50 00
Stairs (complete), $40; Mantels (complete), $100	140 00
Closets (complete) $20; Plumbing (do.), $150	170 00

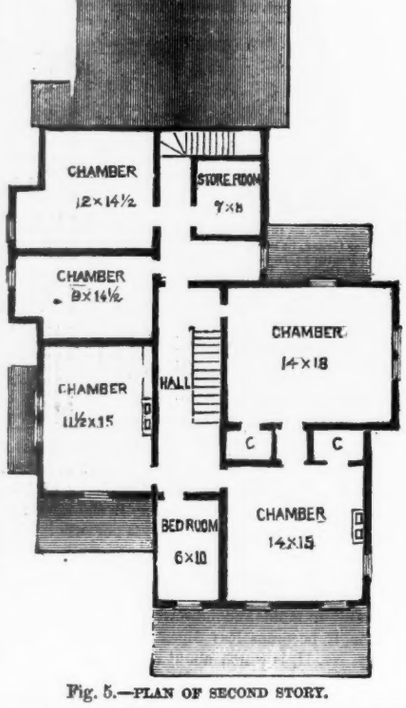


Fig. 5.—PLAN OF SECOND STORY.

8 kegs Nails, $24.00; Carting, $30.00	54 00
Carpenter's labor not included above	350 00
Painting (complete) $220; Incidentals, $127.80	647 80
Total	$3,500 00

The Iceland Sheep.

Sheep do not make any exception to the general rule of the great variation of animals under domestication. They are to a large extent creatures of circumstance, and by degrees, sometimes slowly, and at other times rapidly, they change their outward form, and mental characteristics, to suit the conditions under which they are placed. We would not expect that the sheep of the cold and frozen region of Iceland to be the same as those which have adapted themselves to our warmer and richer pastures. In the accompanying engraving a native Iceland sheep is presented, and it will be seen to be different in many respects from those we grow for profit. The accounts of these sheep, given us by travellers, and Icelanders who have moved to this country, are interesting in showing the widely different circumstances under which they live. They are rarely sheltered from the severities of the climate at any season, and little or no systematic provision is made for feeding them in winter. They find shelter as best they can, behind jutting rocks, and in narrow caverns in the mountains. When overtaken by storms, they are often so blinded by the drifting snow, that whole herds in their wild haste to reach some shelter, rush over steep cliffs and precipices, and are killed. When they find themselves surrounded by the storm, or are "lost," as we might say, the frightened sheep turn their heads towards each other and huddle together as closely as possible, so that by the united heat of their bodies, they may be able to out-last the cold of the storm.

A SPECIMEN OF NATIVE ICELAND SHEEP.

One writer says; "Those in the center relieve in turn, those who in the outer part of the circle, are exposed to the greater severity of the blast; thus necessity sharpens the inventions of beasts as well as of men." "The only kindness which these animals receive from their keepers in the winter, is being fed on fish bones or frozen offal, when their natural food is buried too deep even for their ingenuity and patience to reach." It can be seen that these sheep have a hard life to lead; and the care and attention which they get from their owners, is in no sense commensurate with that which they give in return. It would be natural to expect that animals thus exposed to storm and cold, would be protected with a pretty good coat of their own make, and such is the case. It consists of long coarse hair, which extends a number of inches above the dense covering of close wool upon the body. The fleece is thus made up of two quite distinct materials; and on this account, though it may furnish the best protection for the sheep, is not of first quality for the weaver. The difficulty of separating the two kinds of wool, is a serious objection to the more general keeping of this hardy sheep. They cannot hope to compete with our greatly improved breeds, and if introduced at all, it should be only as a matter of curiosity. This fact is given as an answer to a direct question; it coming from an Icelandic settlement, the people of which were inclined to import and grow their native sheep. One of the leading peculiarities of the Iceland sheep, is the number of their horns, they usually having more than two, and sometimes eight. The one in the portrait has three, two of them much after the ordinary kind in position and general shape, while the third is back and between them, and rising to one side. The supernumerary horns seem to follow no rule either as to numbers, or position upon the skull. When there are more than five horns they are placed in two rows. The use of this extra number of these curious outgrows from the head is not clear to see; they certainly do not appear to be very ornamental.

Peetsi, or the Zebra of the Plains.

The history of the horse, that greatest helper to man among the animals, is lost in antiquity. The breeds and varieties that have been produced, through the many ages that this animal has been bred, are almost endless. Whatever may have been the origin of the horse, and whatever the country from which he has become spread over almost the entire world, there are certain animals that are his near relatives, and still in the wild or natural state. The horse, the ass, the quagga, and the zebra, are, in fact, so much alike in their important characters that naturalists believe they all came from the same ancestral stock. Buffon, one of the most noted naturalists of his day, went so far as to state that the quagga was a hybrid between the horse and the ass, and therefore of very near kin to the somewhat celebrated light-heeled domestic beast, the mule; a view that naturalists of the present day do not accept. The true zebra is a native of the mountainous regions of South Africa, and differs from the horse in several points; its tail is furnished with long hairs only towards the tip—a point which shows its nearer kinship to the ass than the horse. The hind legs of the zebra are without warts; the neck is much curved, the mane short and standing erect. The head, neck, body, and legs, are all striped with black bands upon a background of dirty colored white, or white slightly tinged with yellow. It is considerably smaller than the average horse, being about 12 hands in hight. Besides the zebra of the mountains (*Asinus Zebra*), there is another found on the plains north of the Orange River, which is regarded as a distinct species. *Asinus Burchelli* of the naturalists, the Peetsi of the natives, the "Dauw" of the Boers, and the Zebra of the Plains, of the English. This, which is the animal shown in the engraving, has a more comely figure than the zebra proper, and its ears and tail are more like those of the horse, its tail being furnished with hairs much nearer the root than is that of either the zebra or quagga. Especially in its voice, which is a shrill and sharp neigh, with nothing like the bray of the ass, its closer relationship to the horse is shown. Like the zebra and other related animals, it lives in herds, which, when attacked, form a compact circle with their heads towards the center, and their organs of defence, their heels, presented to the enemy; these they are said to use with such effect, and deal out kicks with such force and frequency, that they are able to repel even the quick and ferocious leopard.

THE "PEETSI" OR ZEBRA OF THE PLAINS.

A Kansas Corn House.

We are indebted to W. S. Wadsworth, of Franklin Co., Kansas, for sketches and a description of one of those large corn houses now quite frequently found in the great corn-growing West. Figure 1 shows a side view of the crib, with the end or front in side section. The crib is 112 feet long, by 28 feet wide, and has a capacity of many thousand bushels (18,000). The method of storing away corn in a large house like this, is an interesting feature. It is done by horse power, which operates a large belt elevator. On the right of the entrance or floor, of the house, the elevator is seen running from *A* to *B*. This is a strong endless belt of leather, which passes over a pulley above and below, and has a series of "buckets" attached to its outer surface. The "buckets" or cups are about two feet apart. The pulley *A*, is connected with one above the letter *D*, and this is turned by a tarred rope, which connects it with the large wooden wheel, 5 feet in diameter, at the top of the turn-post, to which the horse is attached. Thus by a proper construction of the pulleys, a sufficiently rapid motion of the elevator-belt is obtained from the ordinary gait of the horse on the "power." The corn is fed to the elevator-cups through a hopper below the floor; shown only in cross section in fig. 1. The wagon is driven in upon the floor, which is provided with a "Dump." A trap-door, 2½ by 3 feet is opened at the rear of the loaded wagon, at the same time the floor is so arranged, that the whole wagon tips back, as shown in side view in figure 2, and the end board of the wagon box being removed, the corn slides into the large hopper below. It is not necessary to have the whole floor arranged to tip, but simply two narrow sills upon which the wheels must be placed. Mr. W.'s floor is so arranged, and this leaves the central portion of the floor stationary, except the trap-door and movable sills. The corn, after it is carried from the hopper at *B*, to the top of the pulley *A*, where the cups are inverted, is thrown upon a long smooth horizontal belt, which is run by a cord connecting *A*, with the belt pulley at *F*, a short distance below it. This horizontal belt runs the whole length of the storing portion of the house, and just below the ridge-pole, as may be seen in fig. 1, a portion of the roof being omitted for the purpose of showing it. This belt may be shortened at any time when the rear of the house becomes filled. A simple sliding "shoot" is used at the further end of the belt, for the purpose of turning the corn to one side or the other of the house, thus making the distribution of the grain an easy matter. Figure 3 shows a cross section of the storing room, and gives an idea of the way the sides of the house are braced, by means of ordinary boards, nailed to the sides of the beams which run from the ground to the roof. "The crib stands on posts cut 26 inches long, and set in the ground about one foot, and the ground is so raised that no water will run under the same."

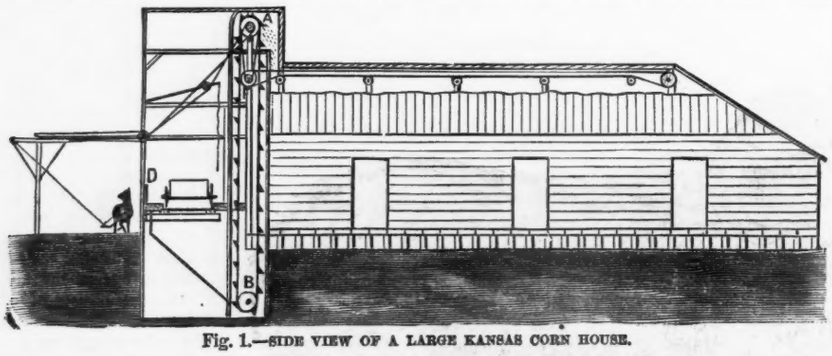


Fig. 1.—SIDE VIEW OF A LARGE KANSAS CORN HOUSE.

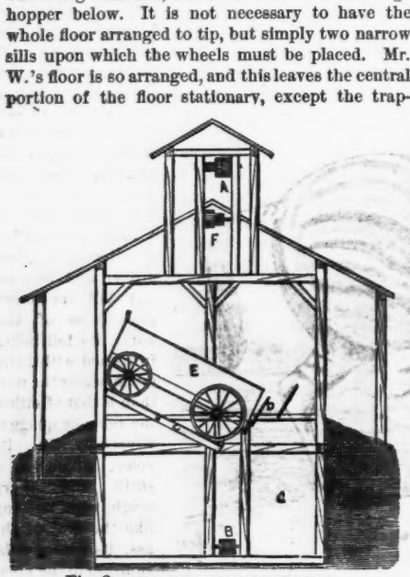


Fig. 2.—END VIEW OF MAIN PART.

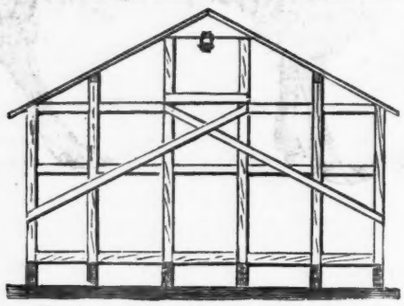


Fig. 3.—CROSS SECTION OF STORE HOUSE.

Among the Farmers.—No. 54.

BY ONE OF THEM.

It is not very long ago that our agricultural papers were printing with quotation marks, and clearly expressed "credit,"—as if the authors should be held responsible for their own Munchausenisms—tales of how Chinese and Egyptian poultry raisers hatched chickens in ovens, or heated rooms, or even in manure heaps. Their readers accepted the tales with grains of allowance, supposing that some truth must lie at the bottom. The times have changed. Now,

Artificial Incubation

is established as an economical system, and before long—I hazard the prediction—more eggs will be hatched by kerosene than under hens. Perhaps I live in rather an incubative neighborhood, but in all probability, we are neither more progressive, nor more experimentally inclined, than many others. There is indeed one monster establishment, which I am ashamed to say I have not visited for many months, where the weekly hatch altogether by artificial heat, amounts to several thousands, where the eggs are collected from the surrounding country by wagon loads, and received by express from hundreds of miles away. This, though it may be, or may not be very successful as a business enterprise, is necessarily what common farmer folk can not imitate. It demonstrates, if demonstration be needed, the practicability of egg-hatching artificially. I have been interested in a more difficult problem, namely: Is artificial incubation profitable on a small scale? That I have not yet determined, yet hope what I write may add to the stock of general knowledge on this important question.

I have an Incubator for 100 eggs, without any automatic means of either regulating the flame, or the ventilation. The double water-tank is capable of holding some seven pails of water, and this mass of water changes in temperature quite slowly, so that after a little experience, the lamps may be so regulated, that the fluctuations of temperature are not very great. The most abundant ventilation is provided. This is superfluous in cold weather, but very important in warm, as the products of combustion, when the lamp is turned down very low, are without doubt deleterious to the eggs, or rather the chicks within them. My own days being largely spent away from home, the Incubator was left to the care of a lad of 11 years, who did very well, but could not be expected to take note of all the changes of temperature, and raise or lower the flame accordingly. We have had some fair hatches, and the young birds have proved exceedingly hardy and healthy, quite so much so as any we ever raised. A very small percentage were weakly, and since what may be termed the casualties of the nest, we have had no deaths by disease, and but one or two by accident. A hawk took one, one was chilled in the dewy grass of a cold morning, another was killed by a cross hen, and that is about all. We have used what is called

A Hydro-Mother,

which is a brooding box with a water-tank, having a screwed top opening, and which will hold 10 quarts of water. We fill it with boiling water, and the chicks nestle under it, having a few folds of flannel between it and their backs. In cold spring weather, the tank was filled morning and evening, in moderate weather, in the evening only, and as soon as the chicks began to take care of themselves—except on very cold nights—they were left to keep one another warm. When a fresh hatch was added, as a rule, the tank was heated once or twice. This of course in dry spring weather. On cold rainy days, we warmed the tank. I think this system is, on the whole, better than heating by a lamp. The "Mother" we use, will hold about 50 chicks, one or two weeks old. We have adopted the practice of excluding the older ones, by putting wire net of two inch mesh before the door. This forces the big ones to put up with an old fashioned hen coop standing close by, except on very cold nights, when we want them inside for extra warmth for the young chicks, and they are allowed to pass within.

A pair of little wheels were placed under the rear end of the brooding box, and so it is moved about. The chicks thus become accustomed to associate their domicile with no particular locality, which will enable us, as the season progresses, to move them up and associate them with the other fowls. This is the story of our own chicken raising this season. We have kept in the brooder about forty chicks at a time. None have been trodden to death by the hens. None have been killed by taking refuge in the wrong coop. None have been troubled with lice or other parasites of any kind. Gapes has been unknown, and of course they have been thriftier and happier than any similar lot of chickens we have ever raised.

Good Luck with Incubators.

I alluded to the fact that some of my neighbors were trying incubators in a small way. They have had better luck than I. Their incubators had self-regulating attachments, and as a consequence there was less watchfulness required to keep the temperature right. They have hatched forty to sixty per cent of the eggs—that is, of the fertile eggs.

The story has often been told how plainly

The Chick can be Seen in the Egg,

but unless a person makes a study of it and examines egg after egg, time after time, with care and a good strong light, very little idea can be had. Pictures of the appearances would only mislead, for the same egg looks differently as it is turned and as the motions within it are more or less active. Of course all the observations are like watching the movements of vessels in a fog, but yet are quite clear when the observer knows what to look for. It would be worth while for any one to break an egg a day for the first two weeks, for up to nearly that time the examination of the eggs before the lamp will be of use. After that no illumination will give much idea of the continued development.

First, we observe on the second day an obvious cloudiness in some eggs—others that prove fertile show very little if any, perhaps on account of the thickness of the shells. The next day the cloud is denser and more local, the next, the head is seen as a black or dark spot, and about the fifth day it will be observed to move about considerably. A motion due to the fact that the yolk which contains at or near its upper surface the germinal vesicle or seat of life, is caused to float in the albuminous fluid by which it is surrounded, the germ side up, by means of thick masses of albumen, called chalazæ. This floating up of the yolk, and of the cloudy appearance and of the dark spots which indicate the places of the eyes and heart, and more or less of other organs as the time progresses, is of course entirely involuntary, but the motions which may be seen on and after the fifth day are obviously voluntary, and I suppose arise from the fact that the intense light is more or less disagreeable to the little prisoner. In some cases this motion is distressingly active, so that the observer is impelled to lay the egg aside and give the little fellow a rest, for fear of hurting him from over exertion.

The Removal of Infertile Eggs

is of course easy, and the thing to do. I found that eggs which had been ten days in the Incubator and were still clear, and when boiled for salad were perfectly good, but of course it would have been just as well to have removed them on the third or fourth day. An infertile egg will remain through the whole period of incubation without essential change, but those in which vitality has once existed, especially if development has once begun and then been destroyed, will soon spoil. So long as eggs remain vital they may be kept fit to eat—at least for many uses. For hatching they should be fresh of course, and the fresher the better.

Eggs should be kept for any purpose in a cool, rather moist place, like an ordinary cellar, and turned once in three or four days. This turning is to prevent the yolk from adhering to the shell. When this occurs the vitality of the egg is lost.

Dry Spring Weather.

May drouths are dreadful. Nothing so takes the pluck out of farmers as to see the grass crop burning up in May, or the rye over their broad acres struggling up to get two or three feet high and heading out with ears two inches long. Wheat comes on a little later, and there may be hope for that, and spring grains with plenty of rain may take a start as late as the first of June. With what shall we supplement the lost grass crop?

I am sowing "Golden Millet." I tried it a few years ago and raised a heavy crop, which was well liked by the cattle—rather coarse hay it is true, but if the cattle will eat it as well as they did before, I shall be satisfied. Some of my neighbors are putting in Hungarian Grass. That is an older and better known forage plant, and they know all about it. They have raised "Hungarian" and sold their timothy for years, and are satisfied. The

New Sorghum, "Early Amber Sugar Cane,"

promises well as a fodder crop, and I have a small patch of that to report upon by and by, but after all when it comes to a main crop—when I must put in something which will surely furnish good and abundant fodder I fall back on corn, Southern White Dent, or Evergreen Sweet. The millets and the sorghums, and the Prickly Comfrey and such things, must stand aside for corn. I suppose I am as old-fogyish as my neighbors who prefer Hungarian to Golden Millet, but old friends and true friends are to be held fast to in such times as these when clover and timothy and even orchard grass "go back on us." This is a season for the French system of *tanking* corn-fodder—"ensilage"—to prove its worth. The experiments, which have been well made, indicate that the value of the process is not much overrated. It is a pity that we can not try this on a small scale, for so many more would thus gradually work into it.

It seems as if a season beginning so dry would prove a wet one by and by, and even if so, the need of fodder crops will be felt, and much can be done after the first of July. Southern cow peas, and all the millets may be sown after that, and will make a crop with any good superphosphate, or with fine bone-dust and guano. I have had the best luck with that—say fifty pounds of Peruvian guano to a barrel of bone-dust. The war on the west coast of South America makes guano scarce and is likely to cut off our supply. Strangely enough we have no really good substitute for this valuable fertilizer.

A Floor for a Cow's Stall.

A floor so constructed as to allow of the quick removal of all liquid manure, and thus be kept

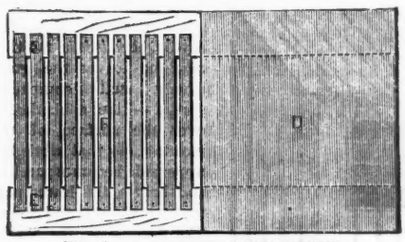


Fig. 1.—A PORTION OF THE FLOOR.

comparatively clean, is shown in the accompanying engravings. The sketches and description are from "C. A. N.," Rockingham Co., N. H., who has had a floor of this kind in use for some time, and is highly satisfied with it. Figure 1 represents a part of the stable floor, the front portion, *D*, for the manger and the fore-legs of the animals, is solid flooring. The rear portion is made of deep, but narrow slats, *F*, which are wedge-shaped, being narrow below and placed one inch apart. The slats, one of which is shown in figure 2, are 3 inches deep, 1¼ inch wide on top and ¾ inch on the bottom. The floor complete is shown in figure 3. The slats rest on cross-timbers, and are far enough from the floor below to permit the use of a hoe in removing the manure, and also to rake under litter of any kind to absorb the liquid manure. The floor should

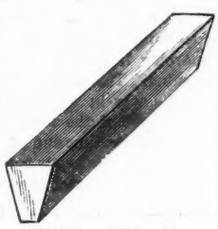


Fig. 2.—SINGLE SLAT.

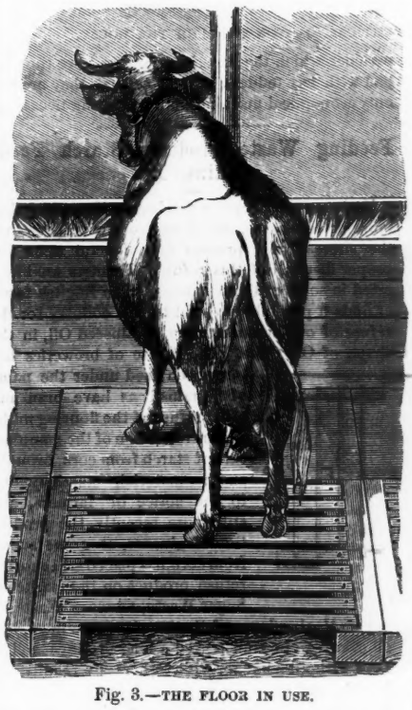
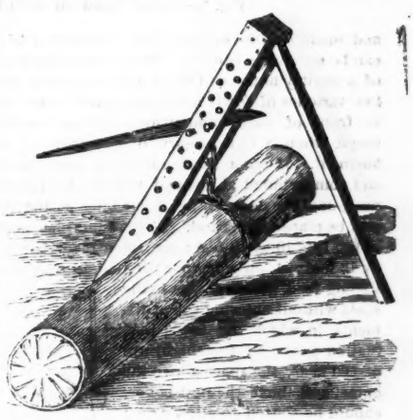


Fig. 3.—THE FLOOR IN USE.

be so long that there may be no danger of the cow stepping off at the rear. "The slats should be of white oak or some hard-wood that will not break or wear out quickly. Those who have used this plan of floor for the stable like it very much; it gives the cows a chance to lie down with some comfort."

A Log Raiser.

It is the thoughtful man who avails himself of any contrivance by means of which a heavy load can be moved without the direct application of main strength. This is what is called *advantage* in mechanics; and it can be obtained by the use of any one of the six mechanical powers, viz., the lever, wheel and axle, pulley, inclined plane, wedge, and screw; or a combination of two or more of these working together. To this end, the gaining of advantage, all machines are made. Mr. Peter Werner, Dubuque Co., Iowa, sends a sketch and description of a device for raising logs, which is shown in the accompanying engraving. The standard consists of two hard-wood planks 2 by 6 and 7 feet long; cleats two inches thick are inserted between them at the ends, and well fastened by bolts. A support 2 by 2 inches of sufficient length, and fastened with a bolt, holds the standard in position. A lever 4 feet long, with a hook, passes between the two planks of the standard. The latter has two rows of holes 4 inches apart and 3 inches apart



A DEVICE FOR RAISING LOGS.

in the rows. Two stout pins are necessary to hold the lever, which latter is provided with notches to fit the pins. In working the machine the pins are alternately moved up a hole at a time. "In this manner, a man can raise a log 3 feet in diameter on to the wagon without other help." There is certainly an *advantage* to be gained in using such devices if the most is to be made out of a limited amount of muscle or power of any kind. Of course it takes longer, but it is easier, and in that is the gain.

Hungarian Grass.—A quick growing plant is required for the production of a second crop upon the early rye or other stubble, and this is well supplied in the Hungarian Grass. If the season is warm and the moisture sufficient, with a rich soil, a large crop of this valuable fodder may be produced in from six to eight weeks. About one bushel of seed is required per acre, to be sown broadcast and slightly harrowed in. From the rapidity of its growth, the Hungarian Grass may be safely sown as late as July; but the best results may be expected when sown as early as June. Sown at intervals of a week or so it will give a succession of excellent succulent green fodder, and that when other green food is often scarce. The plant, when allowed to ripen fully, has a head bearing a multitude of hard, sharp bristles or awns, which are irritating to the stomach, especially those of horses which have fed abundantly upon it. Trouble from these can be avoided by cutting the crop so soon as the head is formed, and at the same time a better fodder in all other respects is obtained. Its excellence as a soiling crop is only equalled by its value for fodder when cured as hay. A few acres of Hungarian Grass on any farm is a good index of thoughtful and profitable farming.

A Cheap and Convenient Poultry House.

Poultry Houses may be expensive buildings—or suitable accommodations that answer the purpose equally well may be very cheaply made. The essential requisites are a warm, dry, well-lighted and ventilated shelter, that will ensure comfort in winter, with convenient arrangements for roosts, feeding space, and nest boxes. In winter, light and warmth are of the first importance. Fowls will not lay when confined in cold, wet, and dark apartments. Windows facing the south or southeast, large enough to admit the sun freely, should be provided,

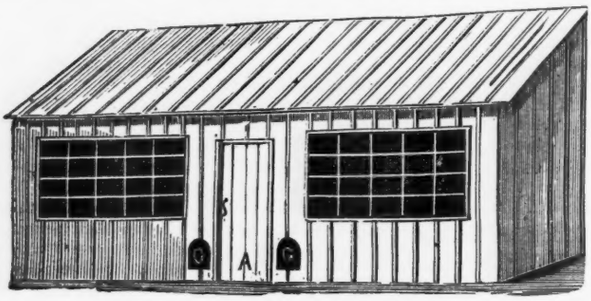


Fig. 3.—FRONT VIEW OF POULTRY HOUSE.

and made to slide so that a free circulation of air can be secured in summer. The accompanying plan of a poultry house will be found convenient, when two varieties of fowls are kept; yards being made in front of each compartment for an out-door range, when it is necessary to keep them in confinement. If but a single variety is kept, the hall and compartment at one end will answer the purpose, and the door, *A*, fig. 1, opening at the side, may be placed at the end. The ground plan, shown in fig. 1, is 10 by 29 feet; apartments for fowls 10 by 12 feet; *A*, outside door; *B*, hall, to provide for storing feed, giving access to the nests without entering the apartments in which the fowls live. Slatted gates, 6½ feet high, are placed at *C;* the space above the gates, and above the nest boxes, should be slatted to allow a free circulation of air. Large windows are in the side at *D, D; E*, nest boxes; *F*, roosts. The back nests are 4 feet high, front nests 2 feet; with large Asiatic fowls the roosts should be made nearer the floor. Figure 2 is a section through the middle of the house—from *O* to *P*, in fig. 1. The slats in front of the nest boxes are marked *H;* other letters as in fig. 1. The front elevation, 9 ft. high, is shown in fig. 3. The doors, *G, G*, for fowls, are near the main door, *A*, and within reach from the hall, so that they can be readily closed without going into the fowl apartment. An opening may be made over the main door, *A*, for the purposes of ventilation, with a sliding shutter that may be partly or entirely closed from the alley. The nest boxes may be 1 foot wide and 16 inches high. For convenience in cleaning, the nest boxes may be made in sections, so that they can be readily taken apart. The architectural

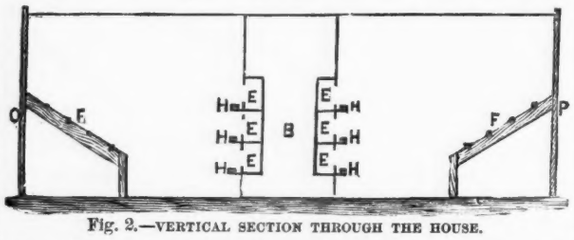


Fig. 2.—VERTICAL SECTION THROUGH THE HOUSE.

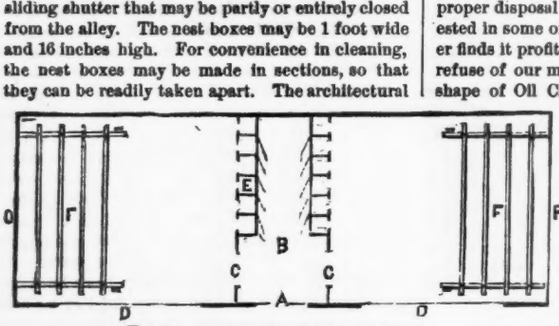


Fig. 1.—GROUND PLAN OF THE HOUSE.

finish of the exterior is a matter of taste, and may conform to that of the surrounding buildings, or, where cheapness is an object, something like fig. 4 or 5 may answer the purpose. Poultry houses are frequently made as a lean-to against other buildings, but all things considered, it is best to have them stand apart, and by themselves. They are not desirable near the horse stable, as vermin are liable to get on the horses unless extreme care is constantly exercised in their extermination.

The Use of Hay Tedders.

Since the introduction of the mowing machine there has been no implement put into the hands of the farmer of more importance than the Hay Tedder. At the present time, tedders are so perfect in their mechanism, and so easy in their action, that they may be ranked among the necessary labor and time-saving machines of the farm. The tedder is of more importance now than in the days when the grass was cut with the scythe, because the mowing machine leaves the grass evenly and compactly spread — like a blanket — over the surface of the meadow, so that while the upper side becomes parched and brittle, the lower portion remains wet and green. The swaths of the scythe mower were shaken out by a hand fork, and the grass left in a position for the air to penetrate the mass to dry it. Now, the tedder follows the mower and tosses the closely laid grass into all sorts of "criss-cross" shapes, and the very best conditions of rapid and even curing are thus provided. By its use the hay may be in many cases so rapidly made that the green grass cut in the morning is well cured, and may be housed, hay at evening. The value of hay depends so largely upon the way in which it is cured, that when the importance of the tedder is considered we must look beyond the time and labor saved, and note that the quality of the hay is much improved by its judicious use. In view of the experience which the American farmers have thus far had with hay tedders, it is clear that they are not only economical machines, but a growing necessity.

Feeding Waste Products—Starch Feed; Grains, Etc.

Various manufactures produce refuse which has more or less value, and it not rarely happens that the success of a process may depend upon the proper disposal of this refuse. Farmers are interested in some of these articles. The English farmer finds it profitable to send to this country for the refuse of our manufacturers of Linseed Oil, in the shape of Oil Cake. The refuse of breweries has long been used under the name of "grains," as have bran and other refuse of the flouring mills. The introduction of the manufacture of starch from corn, brought another material, "starch waste," to the notice of farmers, and still more recently, the production of glucose, or grape sugar, from corn, has placed still another refuse product on the market as Sugar Waste, Glucose Waste, or Sugar Meal. Some of these refuse products, like oil cake, can be transported a long distance, and be kept without change, while others are readily perishable, and can only be utilized as food for stock by farmers who live near the factories. The number of inquiries concerning the feeding values of these waste products, show that farmers are interested in the matter; these, as well as inquiries as to the feeding value of other grains, as compared with corn, were referred to Prof. Atwater; we bring his several replies together in the present article.

"Corn Feed." "Starch Feed,"

waste from the manufacture of starch and glucose from corn. No analyses of waste from glucose manufacture are, so far as we know, accessible. Below are analyses of "Starch Waste," or "Corn Starch Feed" from the Glen Cove Starch Manufactory, Long Island. No. 1, analyzed by Prof. Atwater, "as taken from the factory," weighs from 75 to 85 lbs. per bushel, averaging 80 lbs., and costs 23 cts. per 100 lbs. It is fed to milch cows, about one peck at a feed, being mixed with corn meal, bran, and sometimes roots. No. 2, analyzed by Prof. Johnson, is described as "sold in New Haven, Conn., at 20 cts. per bushel....a moist, slumpy, mass, with a sourish smell."

Fig. 4.—END VIEW.

	No. 1.	No. 2.
Water	12.19 per cent.	62.27 per cent.
Ash	.13 "	.27 "
Albuminoids	3.56 "	5.67 "
Woody fibre	3.36 "	1.58 "
Other Carbohydrates	18.78 "	28.90 "
Fats	1.99 "	1.31 "

No. 1 is calculated to contain, in digestible form: Albuminoids, 3.2 per cent; Carbohydrates, 19.3 per cent; Fats, 1.8 per cent. Reckoning these digestible nutrients at 4½ cts. per lb. for albuminoids and fats, and 9/10 cts. per lb. for carbohydrates, the valuation would be 39 cts. per 100 lbs. Doubtless the glucose waste is very similar to the starch waste.

Fig. 5.—FRONT ELEVATION.

Corn Meal and Grains—Their Feeding Values.

In the *American Agriculturist* for Jan., 1879, p. 10, Dec., 1879, p. 497, and Jan., 1880, p. 9, are analyses and valuations of feeding-stuffs with explanations. The following figures, from these and other sources, refer to American products. They represent, not the total percentages of nutritious materials, but the amounts that are calculated from composition and results of feeding trials, to be actually digestible, and hence nutritious:

FEEDING STUFFS.	*Digestible Nutrients.* Albuminoids.	Carbohydrates.	Fats.	*Nutritive Ratio.*	*Valuation. Dollars per 100 pounds.*
	pr ct.	*pr ct.*	*pr ct.*	*as* 1:	
Corn, N. E. yellow, 8-rowed	8.4	66.8	2.8	8.8	1.04
Corn, Western, yellow	7.5	67.9	2.5	9.9	0.97
Corn, Southern, white	8.2	67.6	2.4	9.1	1.04
Corn, sweet	9.6	16.8	5.9	8.0	1.19
Oats, No. 1, white	8.7	43.3	4.0	6.2	0.94
Barley-feed	10.1	57.1	2.1	6.2	1.05
Rice-feed	7.3	49.1	1.4	7.3	0.82
Wheat-bran, (shorts)	10.0	48.5	3.1	5.6	1.01
Middlings	8.9	54.8	2.6	6.9	1.00
Rye-bran	12.2	46.2	3.6	4.5	1.00
Starch-waste (from corn)	3.2	19.3	1.8	7.4	0.39
Malt-sprouts	20.8	43.7	0.9	2.2	1.33
Palm-nut meal	12.9	56.8	14.0	7.2	1.67
Cotton-seed meal	33.2	17.6	16.2	1.8	2.30
Linseed-cake	27.5	27.0	10.4	2.0	1.89

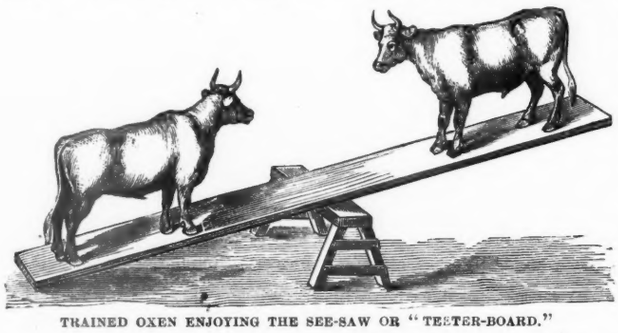
EASTERN *vs.* WESTERN CORN.—The analysis of "Western Yellow" Corn represents sample as brought in bulk from the West. Western Corn, well cured and housed, is fully equal to Eastern, but the field-cured corn, as it actually comes to the Eastern markets, seems to be somewhat inferior to our home-grown, as the figures above imply. Those who wish to study into the composition of American Corn, and other Feeding-stuffs, will find a valuable Compilation of Analyses of these foods, by Dr. E. H. Jenkins, in the Report of the Connecticut Agricultural Experiment Station for 1879.

London Purple vs. Paris Green.—Both of these substances are deadly poisons, and equally effective in killing the Potato Beetle. The "Purple" has some advantage over the "Green" in its greater cheapness, it being a secondary product in the making of aniline dyes. Cheapness obviates the

temptation to adulterate it, as has been done with Paris Green. The Purple is more finely pulverized and can be more thoroughly distributed either in the dry or wet way, and its color is more striking than the "Green," an important characteristic in any poison, making it more conspicuous to the eye.

About Training Animals.

"The Ox knoweth his owner, and the Ass his master's crib," was the expression used 2,640 years ago, by one of the grandest writers of that period, when he wished to express the stupidity of a people who could not or would not think or "consider." The form of expression and joining him with the ass, show the low estimate placed upon the intelligence of the ox in those days, and there has been little change in this respect down to our own times, despite the wonderful improvements made in the physical form of some bovine breeds. We attribute to horses a knowledge almost human, in the feats they are taught to perform, and we all have seen or heard of the "learned pig" even. But the most that is expected or sought for in the ox is to understand "Haw," "Gee," "'G'long," and "Whoa," and the failure to do so brings the inevitable blow from the goad. Thanks to a Massachusetts farmer, and to the enterprise of the noted showman, this low estimate of our patient, faithful servant is likely to be greatly modified. The tens of thousands of boys, and men too, who visit Barnum's "Greatest Show on Earth," as he is pleased to call it, will carry home one new idea at least, if they profit as much as we did, by dropping in specially to see the "trained steers," as that came directly in the line of our profession. They will learn that patience, kindness, firmness, with a reasonable amount of mental ability themselves, and using it, will bring the ox up to almost as high a degree of intelligent action and performance as has ever been exhibited by any other domestic animal, whether horse or pig, and we had almost said dog, though if half the stories told of dogs be half true, we must allow them to be a good deal human. One useful lesson we would inculcate is, that, as patient as is the ox, he doubtless *feels*, more than we are apt to think of, the cruel blows that are ever falling upon him from the first hour of being yoked until led to the slaughter-house, and not even there allowed the most kindly mode of sacrifice—as witness the clubbing, the torture of being swung up by one leg, encircled with a chain, etc. A second lesson is, that by proper treatment he may be trained to be even a much more serviceable friend and servant than he now is. Our own artist has illustrated, a single feat we saw performed by a pair of young steers—grade Alderneys, or perhaps a cross between Alderneys and Ayrshires, said to be twins, rather under medium size, of dark chocolate dun color, shading into black, with flecks and patches of white—about three years old, and raised, we believe, by Henry N. Taft, of Worcester Co., Mass. Well, these trained steers or oxen marched to the sound of music, danced to it a good deal better than the writer could; they, at word of command, or by motion of a whip (not hit by it) changed positions, lay down in different postures and places; knelt and walked about on their knees; they gambolled with each other in various ways, just as signaled to do by word or a wave of the hand; they each lay down, and the other walked over the prostrate one; and they climbed and stood upon boxes scarcely larger than a barrel; one would stretch himself out with his fore and hind feet upon two separate boxes, and the other crouched down and passed back and forth under his mate as often as directed to do so, and then changed places and repeated the performance; they walked up and down stairs, also came up in opposite directions, saluting (we suppose) as they passed. The boys cheered the most when one of them mounted the platform at the head of half a dozen steps, and reaching up his head pulled a string with his mouth that fired a pistol on the top of a pole above. (But this was a trick—the boys at a distance probably did not see that there was a small toothsome carrot on the end of the string.) The older people joined most in the cheering when these oxen deliberately, and with a good deal of ingenuity, managed to get on to the opposite ends of a long plank placed across a center stand two or more feet high as a fulcrum, and then changed their center of gravity and see-sawed as prettily as any two boys or girls do when they call out, "now we go up, up, upie, and now we go down, down, downie." And still more, one of them took position over the center, and by throwing his weight first upon his hind and then upon his fore-feet, which he did with ease, and made the long ends of the plank see-saw with a rapidity and regularity quite equal to their waltzing, in which they tripped off at a step that would hardly be called "light" or "fantastic," but lively, whirling and circling in a way which must certainly have been dizzy and mazy enough for them. We do not remember all their performances, but have given enough to show what can really be done in the way of teaching oxen. They were as gentle as cosset lambs, yet bright, sprightly, and quick in their motions. They travel in the yoke together, and go through all their performances without any boisterous words of command, without any whipping, but with a small whip always in sight, and perhaps an occasional threat, to quicken their obedient action. Their performances are simply the result of *training*, and as such are the evidence of patient, careful work, hour after hour, again and again repeated, by a kindly man. His success naturally suggests to the thoughtful mind the topic of



TRAINED OXEN ENJOYING THE SEE-SAW OR "TEETER-BOARD."

How to Do It.

The writer has had a certain success in training animals, which leads him not only to appreciate good results, but to know by what means they were brought about. When dogs are trained under the lash, they may do very well, but it is crouchingly, with the tail between the legs, with a certain uncertainty, as if they did not know for sure whether the dreaded lash might not be their reward even for well doing. This is pitiable, and is not the case with Mr. Barnum's cattle. They know that the whip is in reserve—and that is right. They have enough of what we may say is "human" in them to need both the reward of well doing, and the dread of the consequences of inattention and laziness. These are the "besetting sins" of oxen, and in fact of animals generally—as well brute as human. Now and then we have a horse, a dog, an ox, not unfrequently a boy, nervous, wide-awake, quick, thoughtful, prompt, easy to teach, that is, quick to learn, and with a good memory. Such are pleasant pupils, and do their teachers credit, but it is no reason why the stupid or less bright ones should not also be trained. Here is where the use of the whip comes in, not to produce fear of the consequence of honestly made blunders, if we may use the expression, but to keep the faculties active, and the wide-awake condition the prevailing one—not a punishment, but a spur. The observations apply equally to horses, dogs, cattle, and children, but of course each of these has its peculiar nature and tendencies which must be rationally considered, and must guide our training; with oxen which are slow in their motions, and deliberate in their thought and perceptions, the quality of patience and kindliness is especially necessary in training. It is easy to make any animal wild and scary, and so spoil the work of hours of patient labor, and cause a lack of that confidence in the trainer which is absolutely essential to success. When provoked by stupidity or wilful obstinacy, the trainer is very apt to get angry. It is the worst thing he can do, and if he can't help it, the thing for him to do—the *only* thing for any teacher to do—is to lay down his whip or rod and go away by himself and cool off; stir up in his own heart a sympathy for the brutes or for the boys.

We do not mean that in training animals a man may after a while go back, when cooled off—and then punish—that is well enough in the case of boys, for we "humans" have better memories and reasoning powers than brutes, and understand that punishment may be delayed and still be just, while with animals the punishment must always follow the offense quickly, promptly, kindly, coolly, *coldly*, as if a law of nature had been broken. If an ox runs into the thorn-bush, the thorns prick, they scratch his hide, they enter his flesh, they *hurt*—not after a while, but then and there, without consideration or pity. The punishment is exactly measured to the offense. We have an advantage over this thorn-bush system of training in that we may use persuasive measures—*rewards* as well as punishment—carrots and sugar as a reward for well doing. When the cattle in the show fired a pistol, they did it by nibbling at a carrot. (We suggest to the great Showman that a duel between the oxen, with clowns for seconds, a mule for referee, and the carrots labelled "satisfaction," would be an appropriate satire, which would be appreciated by the people and satisfactory to the cattle, if the carrots be fresh.)

A Garden Brush.—Mr. L. Prentice, Leavenworth Co., Kansas, sends a sketch and description of a Garden Brush which he has "used with great satisfaction for putting in small seeds. It consists of three poles about three inches in diameter, two of which are arranged as cross bars pinned together near each end, but about eight inches apart; and the third one, serving as a tongue, passes under the front bar and over the rear one, and is pinned

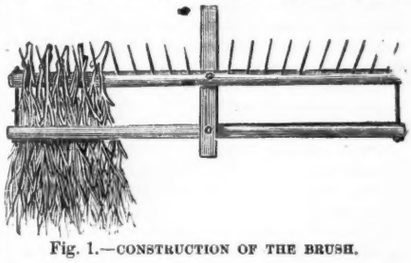


Fig. 1.—CONSTRUCTION OF THE BRUSH.

or bolted to both. The front bar has several upright pins on which the brush is hung by forks in the brush, and passing under the rear pole is held at an angle of about 45 degrees, bringing the small ends of the brush into wear until worn too short, when they are easily replaced." The construction of this garden brush, which is so handy for smoothing over the ground and covering small seeds sown in rows, is shown in figure 1, and in figure 2 it is complete and ready for use in the garden.

Fig. 2.—THE BRUSH COMPLETE.

Keeping One Cow.

[SECOND PRIZE ESSAY.]

[The judges who patiently went through the task of reading over 70 essays of various lengths, inform us that there were many of these that in some one particular were superior to all others, but that in awarding the prizes they were governed solely by the conditions of the offer. We here give the essay to which the second prize was awarded. It was signed "Doctor," and was found to be by W. L. Battles, Gerard, Pa. The prize essays, together with several of the most desirable of the others, will soon appear in a pamphlet or book form.—EDS.]

Instead of writing on how a cow might be kept, I propose simply to tell just how we manage our cow, what we feed her, how we procure that food; in fact, everything relating to her care, so that any one can go and do likewise.

"Spot," we call her, for she has a beautiful white spot in her forehead, is not a Jersey, for we can not afford to buy one at the prices at which they are held with us; nor is she a thorough-bred of any kind; yet she is a good cow, of medium size, fills a twelve-quart pail each night and morning, when her milk is in full flow, that raises a thick coat of rich cream, which, after being churned, furnishes all the butter needed for a family of six, and some to spare. Our place is small, only two acres, and a portion of this is covered by the dwelling, barn, poultry-house, etc. The fruit garden occupies about one-fourth of an acre, and from this portion nothing is grown to furnish food for "Spot." Adjoining the barn there is

Half an Acre in Grass,

or mostly clover; fine manure is liberally spread over this each spring and fall, and every spring a quart of clover seed is sown, so as fast as the old plants die out, young ones take their place. A bushel of land plaster is sown on this when the grass begins to start in the spring. This plot produces a very heavy growth of grass and clover, enabling us to cut it three times each season; about the first of June, August, and October. A coat of fine manure is always spread over the ground immediately after each mowing. The grass is mostly cured, and makes fine hay for winter feeding. Occasionally a small portion of the crop is used green for soiling. Besides the land occupied by buildings, fruit garden, and clover plot, there remains about one acre, which we call the garden. Here are grown all the vegetables for the family's use, besides some to sell. About one-fourth of it is planted to Early Rose potatoes, and as soon as these are sufficiently ripe for use or market, they are dug, and sweet corn, in drills, for fodder, is sown upon the land. Another fourth of an acre is planted to sugar-beets; the ground being very rich, the yield is always large; this season (1879), although very dry, I harvested 178 bushels. Our cow is very fond of the beets, and I think there is nothing better to keep up a flow of milk, and they give it no bad flavor, as do turnips. An additional fourth of an acre is planted to sweet, or evergreen, corn; as fast as the corn is picked for use or market, the green stalks are cut up, run through the cutting-box, and every particle of them consumed. As soon as the corn is all harvested, the ground it occupied is thoroughly fitted and manured, and then sown to winter rye, to be used for soiling the next spring, after which the ground is again prepared for corn. The remaining fourth acre is devoted to early peas, beans, cabbages, and other garden vegetables; as soon as one crop is off, the ground is prepared, and something else is almost always planted or sown; consequently, on the most of this acre, two crops are produced each season, except where sugar-beets are grown, or late cabbages, which require the whole season to mature. With the clover on the half acre, and the forage crops and roots on the acre, we have not only had sufficient food for the cow the entire season, but have also kept our family horse, with the exception of one load of oat straw purchased for three dollars, to mix in with the fodder corn; this is hard to cure sufficiently to keep bright and sweet through the winter, but by mixing a layer of corn-fodder, and a layer of straw, it all comes out nice and bright. Besides keeping both horse and cow, we have marketed from this little farm, in berries, vegetables, butter, eggs, poultry, and one fat hog weighing, dressed, over 300 lbs., $468 dollars worth of the above produce, keeping enough for our own use, and salting down one barrel of pork.

The barn is 25 by 30 feet, with the stable on the south side. The stall for "Spot" is five feet wide, and the floor on which she stands is five feet long, with a manger two feet wide in front, one and a half foot high next to the cow, and three feet next to the barn floor. She is fastened with a wide strap around her neck, attached to a chain eighteen inches long, which is fastened to a staple driven into a post at a corner of the stall adjoining the manger; this gives her room to turn her head so as to lick any portion of her body. The floor is made of two-inch plank, battened on the under side with thin boards, raised from the ground ten inches in rear and one foot in front; all the droppings and urine fall into the four-foot alley behind. This alley has a clay floor beaten perfectly solid and level. Next to the stable door is a large bin, 10 by 7 feet, for storing road-dust or muck; at the other end of the stable is another bin, 10 by 11 feet, for storing leaves for bedding. My great object is not only to make "Spot" comfortable, and have her stable free from all bad odors, but to save all the manure, both liquid and solid. I find the

Best Absorbent to be Dried Muck,

pulverized, or road-dust from clayey roads. As it is easier to procure the latter, I generally make use of that, and always keep from two to three inches of it in the alley; this effectually absorbs all the liquid portions and all offensive odors. Twice each day this is thrown out through a window closed by a sliding shutter in the rear of the stall, under a shed, where it remains until wanted for use. In the fall I go to the woods and procure a sufficient quantity of leaves to last until spring; a liberal use of these not only makes a nice, soft, clean bed, but largely increases the quantity of manure. The stable opens into a small yard, across one corner of which runs a small brook. Each morning the cow is permitted to go out and drink; if the weather is pleasant, she is allowed to remain out an hour for exercise. She is let out the same at night, after sunset in warm weather, so that she will not be annoyed by flies. The barn is well battened, and is warm in winter; it is well ventilated by two windows, but these, in summer, are darkened by blinds, with wide slats to keep out the flies. Each morning, while "Spot" is eating her breakfast, she is well curried with a curry comb or card, and if any filth is observed on her bag or teats (which is very seldom), it is carefully washed off, if in winter, with warm water. She is

Always Treated Pleasantly, Never Scolded,

nor whipped; consequently she never kicks over the pail, or holds up her milk. She is fed in winter with a peck of sugar-beets cut up, both morning, noon, and night; also a bushel of cut feed, either corn-stalks or clover hay, wet with a pailful of hot water, with two quarts of "sugar meal" or bran, thoroughly mixed together, with a little salt sprinkled over it. I generally use what is known here as "sugar meal" to mix with her feed; it is corn meal from the factory after the sugar or glucose has been extracted; it costs from 10c. to 12½c. per bushel, and I prefer it to bran, and "Spot" likes it very much. We consider her a machine for converting the food we give her into milk, and the more we can get her to eat and digest, the more milk is obtained, and the greater the profit. It is a good plan to change the food occasionally, substituting carrots for beets, clover hay for corn fodder, for brutes, like mankind, are fond of a variety.

There are root-cutters that can be procured for cutting up roots, but I have always used a common spade, ground sharp, and an empty flour barrel to hold the beets. It takes but a few minutes to cut up a mess of beets in that way. With one bin full of road-dust, and the other full with leaves, a winter's supply of litter is secured, and it is surprising what a pile of manure we have in the spring. Another valuable source of manure is the pig-sty, with plenty of leaves for a warm bed, and sufficient road-dust to absorb all the liquids, it is astonishing how clean our pigs are, and the sty is free from all bad odors; the big potatoes, and mammoth beets, show the richness of the pig-pen fertilizer. I think our fifty hens pay for all their food with the droppings the poultry-house furnishes. The roosts are over a slanting platform, which is kept covered with road-dust both summer and winter, the droppings fall on this floor, and roll down into a large box twelve feet long, three feet wide, and three feet deep. The dust the chickens work down with the droppings is sufficient to absorb all the ammonia and preserve all the fertilizing qualities of this most valuable guano. A large box of road-dust is always kept in the water-closet, a liberal use of which furnishes a quantity of most valuable fertilizer, besides freeing the closets from all noxious smells. The wash water and slops from the kitchen are utilized by being thrown on a pile of sods and other rubbish, which are forked over, and as soon as decayed, carted to the manure pile. From so many sources we are enabled to give our small farm a

Most Liberal Supply of Manure

each spring and fall, so that even with the double cropping most of it gets, it continues to improve, and yields more bountifully each succeeding season. For sugar beets, the ground is first manured heavily, plowed deep, and thoroughly pulverized with the cultivator, then marked out in rows with a garden plow, two feet apart. Manure from the poultry-house is scattered in each furrow, which should be lightly covered with soil, so the seed will not come in contact with it; drop the seeds about six inches apart, covering lightly with the garden rake. When the leaves are about four inches long, thin out to one plant in a place, and fill any vacancies with the plants pulled out. Hoe them thoroughly, destroying all weeds, which can easily be done by cultivating each time before hoeing, with a narrow cultivator. Keep the ground mellow, and cultivate three or four times, after which they will take care of themselves and soon cover the ground. With ground in good condition, and a fair season, 600 to 800 bushels per acre can be easily produced. Let them grow until frost comes, when they should be dug with a garden fork, the tops cut off, and stored for winter. Those to be used before the first of March, are stored in the cellar, the others are buried in a long pit, digging out a shallow place, piling up the roots about three feet high, and three feet wide, covering well with straw and sufficient soil to keep them from freezing, putting in a drain tile about every four feet in the top of the pile, with one end to project a little through the covering, for ventilation. If the weather becomes very cold, lay a turf over the tile, and remove when pleasant. I grow carrots after the same plan, and store in like manner. I prefer beets, as they are so much larger, it is less trouble to gather and take care of them, and the crop is generally larger, still I always grow some carrots for a change. I plant sweet corn in drills, always put some fertilizer along the furrow, dropping the kernels about eight inches apart, with the rows three feet wide, I commence planting soon after May first, and continue at intervals until about July 1st, so I can have a fresh supply for use, and market, all the season. The sweet corn being grown on the plot sown to winter rye, for soiling, enables us to cut some portions of it twice, before the ground is needed for corn. When sowing corn for fodder, which is done as soon as we commence digging the early potatoes, I sow it in drills two feet apart, and drop the kernels about one inch apart in the drills, manure from the pigsty is first dropped in the furrow, and covered with soil at least two inches deep, or the corn will not come up. This fertilizer is so strong, if properly used it causes a most extraordinary growth of stalks. While the corn is small, cultivate it two or three times with a narrow cultivator, when it will take care of itself, and there will be a surprising growth of stalks; I have them often six feet high. Just before time for frosts, cut it with a scythe, and set up in small bunches bound around the top, and leave to cure until cold weather. When it is to be put in the mow, spread

alternately a layer of stalks, and a layer of straw, and it will keep bright and sweet until wanted.

The Rye for Spring Soiling,

is sown when the sweet corn is picked, and stalks removed, in drills about ten inches apart. Fine manure is spread on the ground after plowing, and thoroughly mixed with the surface soil, and one or two hoeings being given to keep the ground mellow, and to destroy any weeds that may make their appearance. By May 1st, the early sown rye will cover the ground with a dense growth, at least four feet high, furnishing a large quantity of most nutritious green food. On those portions of the plot where the latest corn is to be planted, two or three cuttings are made; this makes most excellent food for the cow, and the quantity grown on this fourth of an acre will surprise any one who has never tried it. There is quite a plot of early peas, and as soon as the last picking occurs, while the vines are green, they are pulled and fed to "Spot," who relishes them very much. Turnips, or corn, is at once sown on the ground where the peas were.

When our early cabbages are taken up, all the leaves, and much of the stalks, are turned into milk by taking them to the cow's manger, and the ground at once planted, or sown, to something that will make more food. The beet, carrot, and turnip tops, and late cabbage leaves, make quite a quantity of feed late in the fall, if care is taken in saving and preserving them. Possibly there may be some better forage crop than "evergreen," or sugar corn; I think another fall I will try the Minnesota Amber Sugar Cane, in a small way. I tried Pearl Millet, in one row, this season; it tillered, or spread wonderfully, but did not do so well as the corn, as the stalks were small, and the millet makes such a feeble growth, at first, it requires the whole season to make as much fodder as I get from corn sowed the fourth of July. I generally manage to have the cow come in about the first of September; by that means, the six weeks she is allowed to go dry, occurs during the very warmest portion of the summer, during July and August, when, with the facilities the person possesses who keeps but one cow, it is difficult to make good butter; it is also the season when butter most generally sells the lowest.

The calf is taught to drink after it is a week or ten days old, and fed on a porridge made from skim milk and wheat middlings, or shorts; by the time it is six weeks or two months old it will be well fattened, and can be sold to the butcher for veal, at a good price, for at that time of the season veal is scarce and in demand. The cow being in full flow of milk all winter, when butter is most always high, will pay a good profit for her feed and care. A couple of weeks previous to the time the calf should be born, I make a box stall on the barn floor, and permit the cow to run loose in it until the calf is taken away to learn to drink. During this time she should have a good bed of leaves, and the stall cleaned each night and morning. So far at such times I have experienced no difficulty, or trouble; should any occur, it is better to apply to an experienced person, than to try and doctor her yourself. After the calf is born, I feed the cow on warm slops a day or two, permitting the calf to suck until the swelling has gone from her bag, and it has assumed its natural condition, then, as before stated, teach it to drink, which can easily be done, by inserting the finger in its mouth, and putting its head in the dish, cautiously withdrawing the finger, a few times, and in a short time you will have no difficulty, as it will help itself.

In conclusion, I can say I have tried to state just how our cow is managed and kept. I presume there can be improvements made on our system. I shall be glad to take advantage of the experience of others, at any and all times. No record is kept of the milk obtained, nor the butter made. We know we have always plenty for the family's use, and considerable to spare. Bread and milk furnish the children half their food a portion of the time; pure milk and plenty of fresh fruits, in abundance, we consider to be one of the principal reasons why our family is so healthy, and we have so few doctor's bills to pay.

From our acre and a half, all the food has been grown for both cow and horse, except the $3 expended for straw. The "sugar meal" given the cow has not cost over $5 during the past year; it is safe to say that one half, and probably more, of the clover, corn fodder, green rye, etc., has been fed to the horse, consequently the keeping of the cow can all be credited to the small area of

About Three-fourths of an Acre

of land, in addition to an outlay of not exceeding $7 for meal, bran, and straw. This land, about one half of it, has also produced, in addition, full crops for the use of the family, or market, while the sour milk, and buttermilk have largely assisted in making 600 lbs. of pork. The calf, at less than two months of age, was sold for $8, which more than paid for the extra feed bought for the cow. The family that has never kept a cow can hardly realize the satisfaction and benefits derived from such a source. Children, whose appetites are often capricious, will almost always relish a cup of cool milk. Cream, for our coffee at breakfast, is much enjoyed by all, but realized by few, and what can be more delicious than a nice dish of strawberries smothered in rich yellow cream. When we consider the small expense, the little trouble and care, contrasted with the great benefits derived, it seems surprising that any family will deprive themselves of so great a boon as that of keeping a cow. "DOCTOR."

Novelties are not always New.

Implements and devices of various kinds are from time to time brought out and fully explained as new, when the facts are frequently far otherwise. An illustration of this came to our notice a short time ago, in looking over an old work on agriculture, entitled, "The English Improver Improved, or the Survey of Husbandry Surveyed" (1652). On page 202 of this ancient work, a number of plows are figured, among which is, "The Double Plough, ploughing two furrows at one time." It is not to be expected that 228 years of the most progressive time in the world's history has brought no changes in the construction of double plows; but nevertheless the fact of their antiquity remains the same. The directions for the making of the old double plow are very full, and as a matter of historical interest, we give some of the points, together with an exact reproduction of the plow itself. "The double plough shall be as plain as may be, it shall consist of one long beam of an ordinary length, and another short one, little above half the length of the other....I proceed to the making of the hindermost plough, which must be made in all its members and branches like the other, except the beam cut off three inches before the Coulter-hole.....The handles upon the last plough you must set to the

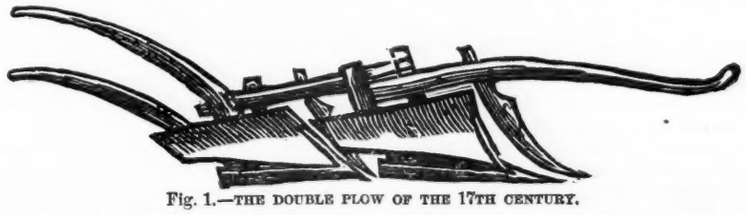


Fig. 1.—THE DOUBLE PLOW OF THE 17TH CENTURY.

placing of it in his place, which I discover thus, the first plough standing in its working posture, the other plough with the handles to it, to be affixed on the nearer side, or left-hand, one furrow-breadth wider than the other, just in the same posture, both for depth and breadth as the other doth, and so held off from the first plough-beam, by a lining or filling of wood, just that substance as may continue it firm and fast.....All which may be so keyed and cramped up, that it may be as one solid beam, and so move as the first moves.....I for present see not but it may be of excellent use and expedition, upon many lands in England; and to say much more is needless, in regard of which hath been before spoken, and experience of a good ploughman will order it at pleasure."—Both the plow, and the language of its description are old, but on this account are not the less interesting. "As to the Coulter, (fig.2), his truth of workmanship lyeth in this, whether it be Dutch or English Coulter.....If a Dutch Coulter, then the wheel to be very well slutted, and about ten inches high, and to go as true as possible; for the false cutting of the wheel will make you work at a great uncertainty, which Coulter is not useful, neither upon stony, gravelly, flinty, broomy, or rooty ground, but upon pure turf, or pure mould, on which it goeth very easily. The midst of the wheel had need be an inch thick, because of wearing, and so wrought thinner and thinner towards the edge round, untill it comes to be as thin as a knife if it were possible, but because this Coulter is with many of high esteem, and of some advantage, and yet not much known, I will give you a figure of it, as also of the best sort of English for its compass." This old instrument for cutting the sod before the plow, in its general make-up or "style," as we may call it, is very different from those used at the present day, but the principle of construction and action is the same, namely, a revolving cutting edge. Those persons who are of the opinion that the wheel Coulter so largely mentioned and generally re-introduced some years ago, was entirely new, must on seeing this, feel in some measure the basis of truth in the wise-man's saying, "There is no new thing under the sun."

Fig. 2.—ANCIENT WHEEL COULTER.

Replacing a Horse's Shoe.—In the busy season on the farm there is often much time lost and work delayed by frequent journeys to the blacksmith shop. Many of these visits are unavoidable; but when made for the simple resetting of a single horseshoe, it is expensive. A job like the replacing of a "thrown" shoe should be done at home. It is not a difficult one, and the needed tools are few and inexpensive. A light hammer, a pair of pincers, a punch, all of which every farmer's work shop should contain for other uses, and a few horseshoe nails, are all that is necessary. It might be well to add to this a blacksmith's plane to smooth down the face of the foot, but for the simple resetting of the shoe this is not required. If the shoe is only loose, it may be tightened by driving up the old nails and clinching them anew, but if quite loose it had better be taken off, which can be done with the pincers, care being taken to not break the hoof. All the old nails should be removed by using the punch. The most difficult matter is the driving of the new nails, which must be so "pointed" at the end that they may not go into the "quick," but come to the upper surface of the hoof an inch or so above the sole. This can be learned by watching a blacksmith, and if he is a good-natured one he will willingly show how it is done. A little practice will render it an easy matter to drive the nails in the proper manner. As the nails are driven through, they should be turned down, and afterwards nipped off with the pincers and curved in to hold firmly. The work of resetting a shoe can be quickly done, and at a time when no loss is incurred. The morning before work, or the hour of rest at noon, may be so employed, and a journey saved, of miles it may be, to the nearest blacksmith. The shoe may come off at a time when replacing it at once will save the labor of the team and hands for a half a day or more, in which case the ability to reset the shoe is a very labor-saving accomplishment, and should be possessed by every economic and energetic farmer throughout the country.

A Baker's Oven.

The following designs, figs. 1, 2, 3, and 4, represent a baker's oven, suitable for a village of from twelve to fifteen hundred inhabitants. It is built under ground, and usually placed below the side-walk in front of, and adjoining the basement, or baker's work-room, towards which the openings are made to face. This position is preferred because of its accessibility in building and repairing. Figure 1 shows the position of the oven openings and doors, as they appear on the inside of the basement wall. The hight of this wall is 8 feet. If the general depth of the basement is less, then a pit is made in the bottom, immediately surrounding the oven front, with a marginal step of brick work. The doors and their frames are of cast iron, and are set in the brick-work when building. The upper double doors open from the oven's mouth; below it is the door of the ash pit. The round opening above the double doors has an 8-inch iron collar, to which a smoke pipe is attached, leading to a chimney. The niche at the side, and on a level with the oven mouth, is for a yeast kettle, below which is also a grate, and ash-pit doors.....Figure 2 is a plan of the oven floor, and the surrounding walls; *A*, floor, "pear-shaped," and measuring an average of 9 feet in diameter; *B*, iron grate bars, and frame; *C*, *C*, openings to the smoke flues; *D*, yeast kettle (16 quarts); *E*, *E*, foundations of stone-work: *F*, mouth of oven; *G*, *G*, front wall. ....Figure 3 is a cross section showing the construction of the foundations, ash-pit, oven arch or dome, smoke flues, and the surrounding earth.....

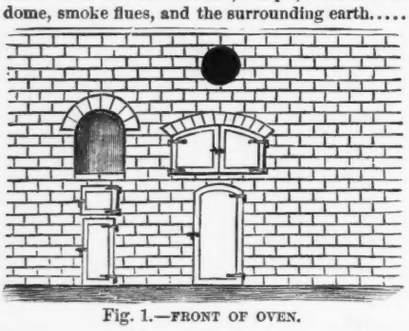


Fig. 1.—FRONT OF OVEN.

Figure 4 represents the top of the completed oven, and the course of the smoke flues, the latter leading from *C*, *C*, in fig. 2, to the smoke-pipe opening shown in figure 1.....In building it is important that the foundations shall be solidly constructed of the best material, at least 2 feet thick, and 13 feet square, with a perfectly level surface.

The shape of the floor is then described on the surface, the grate set, the floor laid of fire-brick, and the surrounding brick-work started to a hight of 4 inches. The interior mold or form of the dome is then made of sand, raising the center 18 inches. The dome is laid upon this mold, the first course being of fire-brick and the balance of ordinary hard brick. Over the dome the smoke flues are laid, also of hard brick, and the whole covered with a coat of hydraulic cement mortar, and finally enclosed with earth. In laying the flues, care must

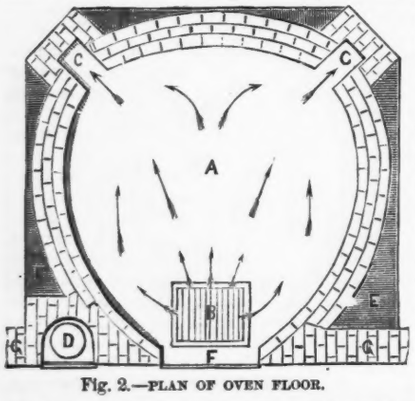


Fig. 2.—PLAN OF OVEN FLOOR.

be taken to make the interior smooth with straight sides converging at the pipe opening from which they may be cleaned as required. A damper is required in the smoke-pipe to regulate the draught. The smoke flue from the kettle grate may be built in the wall or by pipe leading to the chimney, as

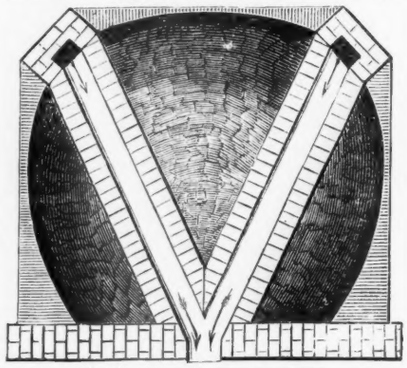


Fig. 4.—PLAN OF TOP OF OVEN.

shall be most convenient. At completion the sand may be immediately removed from within the oven through the mouth, and the whole allowed to dry out for at least eight days, after which a slow fire may be started on the grate, and increased gradually until the required degrees of heat are obtained, and the oven is then ready for baking.

Sawdust for Bedding.

One of our most valued correspondents writes: We have tried for two years dry sawdust in the cows' stable, and on the whole like it better than any bedding we have ever tried. It makes a more comfortable bed, completely absorbs the urine, and the cow is kept clean with less labor than when any other is used. The objection to salt marsh sods, dried, or to headlands, and dry muck, is, that they soil the cow, and make it necessary to wash the bag before milking. Straw, of all sorts, soon becomes foul, and, without more care than the ordinary hired man is likely to bestow, soils the cow's bag also. Dry sawdust is clean, and makes a soft spongy bed, and is an excellent absorbent. The bag is kept clean with the aid of a coarse brush without washing. A charge of 15 bushels in a common box stall, or cow stable, will last a month, if

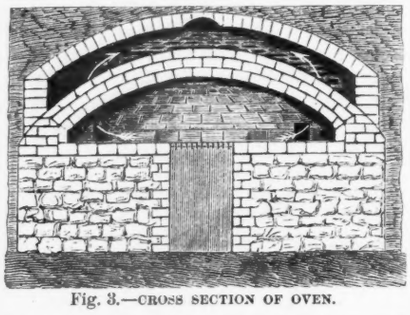


Fig. 3.—CROSS SECTION OF OVEN.

the manure, dropped upon the surface, is removed daily. The porous nature of the material admits of perfect drainage, and of rapid evaporation, of the liquid part of the manure. The sawdust is not so perfect an absorbent of ammonia as muck, but is a much better one than straw, that needs to be dried daily, in the sun and wind, to keep it in comfortable condition for the animals. In the vicinity of saw and shingle mills, and of ship yards, the sawdust accumulates rapidly, and is a troublesome waste that mill-owners are glad to be rid of. It can be had for the carting. But even where it is sold at one or two cents a bushel, a common price, it makes a very cheap and substantial bedding. The saturated sawdust makes an excellent manure, and is so fine that it can be used to advantage in drills. It is valuble to loosen compact clay soils, and will help to retain moisture on thin sandy and gravelly soils. There is a choice in the varieties of sawdust for manure, but not much for bedding. The hard-woods make a much better fertilizer than the resinous timber. To keep a milch cow in clean, comfortable condition, we have not found its equal. *

Shocking Grain.

One of the greatest sources of loss in the grain field arises from the imperfect putting together of the bundles in shocks for curing. The common practice of shocking grain in a careless and hurried manner is, in a literal sense, "shocking." It matters not how perfectly all the other operations of the grain field are done, if the bundles are not properly set and secured from the wind and rain, the grain can not be, in "catching weather," above second class. If the shock becomes once wet through, as, if not well made, it is sure to be during a rain, the grain is very apt to grow in the shock, and poor flour, and consequently an inferior quality of bread, is the result. There is no trouble in making the shocks in the right way, if one determines to do it, and will use a little common sense. It is a common way to cut down and bind up, all the day through, and just as night is coming on, all hands turn to and set the sheaves up in the most rapid manner possible. Should a strong wind arise there are few shocks thus hastily thrown together, but will be whisked and tumbled into a confused heap. Hurried work like this is all wrong. If any farm-work should be done with care, it is the shocking of the grain.

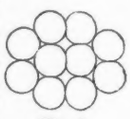


Fig. 1.

The number of bundles in the shock may vary somewhat, 16 is sufficient. Each bundle should be set firmly upon the ground, and this can be best done by taking one in each hand at the same time, bringing their heads closely together. After three pairs have thus been placed in two rows, two more are to be put upon each side, thus making an oval shock, shown in outline in figure 1. The heads of all the bundles are then to be pressed together, and the cap-sheaf adjusted. This is done by taking an ordinary sheaf, with the band shoved down to within eight inches of the butt, and the top bent out into the shape of a funnel—this done, the sheaf is placed on the shock as shown in figure 2. A second form of shock, which may be considered a double form of the one just described, is shown in outline in figure 3, and consists of 16 bundles, including the two top-sheaves. Four pairs of bundles are first firmly set together, and three placed on each side. The cap-sheaves are made as in the first case, only one side of the "funnel" is left open, each sheaf forming one-half of the shock-cap, as shown in figure 4. Grain that is shocked in either of these methods, and is done by a man who cares for the quality of his work, will stand and be perfectly safe and sound, when the piles made by boys too small to set the bundles firmly down, or worse, by careless, wasteful men, will be wet through and approaching the state of a pile of litter.

Fig. 2.—SINGLE CAP-SHOCK.

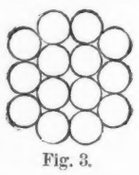


Fig. 3.

Fig. 4.—DOUBLE CAP-SHOCK.

There is Work in America. — A writer in "The Farm" (Dublin), tells his countrymen that America is no place for the idler, but a country where work is wanted, and where it is always well awarded. "If our laborers were equally diligent at home, our farmers would be able to give better wages, and more employment." — "Thousands of laborers think that they have only to go to America, make money, and live happy all their days."

The Leaf-Folder of the Grape-Vine.

Grape culture is in one respect no different from any other branch of horticulture—it is a continuous war upon insects. Those who give proper care to their vines, meet with a constant succession of insects from the time the young shoots push until the fruit is well advanced. One of the earliest in this procession is found at the very ends of the developing shoots; after a few leaves and embryo clusters, or bunches of buds have shown themselves, something appears to be the matter at the end of the shoot. While the lower leaves go on and grow, the uppermost cease to develop; they appear to be stuck together, which an examination will show to be really the case; the leaves are held together by threads, and in the cavity thus formed will be found one or more small caterpillars, as shown in figure 1. These caterpillars, when full grown, are half an inch long, of a pale green, and on each of the rings are cream-colored warts, each of which bears a tuft of white hairs; when very young these hairs are not present. In about three weeks, during which time it has eaten leaves, and it may be the buds, it goes into the pupa state. It fastens its head portion by a few threads, and with its body standing at an angle of about 40°, and curving forward, it turns into a chrysalis, which, singularly enough, is green when on the leaves and brown when on the bark of the old wood—a measure of protection, we may suppose, against the attacks of birds. After remaining in this apparently uncomfortable position for about a week, its changes are complete, and the perfect insect comes forth a small moth, shown in figure 2, of the natural size, which, as well as figure 1, is from Prof. Riley's Third Report on the Insects of Missouri. The moth is of a tawny yellow color, with the front wings marked with white and dark-brown, while the hind wings appear like burnished copper. This belongs to that group of moths known as *Plumes*, for the reason that their wings are split into feather-like lobes. This is known as the Grape-Vine Plume, its scientific name being *Pterophorus periscelidactylus*. The first or generic name means *wing-bearer*, and the other, or specific name, is a very long word for expressing the fact that the insect has *anklets*, its legs being surrounded by tufts of brown scales. Whether there is more than one brood in a year, and in what state the insect passes the winter until the young shoots of the vine appear, are points in its history not well made out. The harm the insect does is ordinarily but little. Usually each shoot of our native vines bears three bunches of grapes, and these appear opposite the three lower leaves. Ordinarily these leaves and the bunches of buds that are to produce the grapes are developed, at some distance below the bud where the caterpillars are at work. We are aware that there are exceptions to the number of bunches produced upon a branch, but ordinarily all the buds for the crop for the season are out of the bud and sufficiently below the point at which the insect has tied the leaves together to escape, and when a bud is found to contain the caterpillars, a pinch with the thumb and finger will remove it and prevent the insects from doing further mischief. But, many will ask, will not the removal of the bud, and thus preventing the further growth of the shoot in length, injure the vine? Not at all. It is exactly what some vine-dressers would do were there no caterpillars in the bud. Grape growers differ as to how far beyond the fruit the shoot should be stopped, but all agree in stopping it somewhere. The successful vineyardists of Missouri, including Mr. Husmann, stop the shoot just above the last bunch, while others leave two and three leaves above. This pinching is done very early, so soon as the clusters of buds can be fairly seen, and results in finer, larger, and better ripened fruit than can be had by leaving the shoot to grow in length. If the pinching is attended to in time the caterpillar is despatched before it can eat many leaves beyond those in which it incloses itself. If the presence of the caterpillars leads to promptness in pinching, it may be a benefit rather than an injury.

1.—THE CATERPILLARS.

Fig. 2.—THE MOTH.

Planting Fruit Trees for Ornament.

BY SAML. B. PARSONS.

The question is often propounded why a farm intended exclusively for fruit should not be planted for landscape effect; why a lawn could not be planted for ornament and only fruit trees be used. The only answer is that it is eminently proper and easily practicable so to plant both farm and lawn, that these results can be obtained, and the eye, the palate, and the pocket, all be gratified. The farmer will at once say, and truly, that to this there are two objections. The first is that he has no skill in the artistic laying out of grounds and grouping of trees, and that he can not afford to employ a landscape gardener for that purpose. The second objection is that fruit trees will not flourish when they are young without culture, that spade work is too expensive, and that he can not plow among trees irregularly grouped.—To avoid, therefore, straight lines, and yet to retain regularity sufficient to allow plowing, may not be productive of the best landscape effect, but may produce an approximation to it, and will certainly give much pleasure. The accompanying diagram will show the simple method by which any farmer can plant the space around his intended dwelling with fruit trees, and yet so preserve their irregularity that from his dwelling there will appear no straight lines.

A circle or its segment is the most pleasing line known. It is that of the sky above us, and could our eyes grasp it would be that of the earth below. The old Romans knew this when they adopted it for their arch, which the Gothic arch of the ruder ages can not equal. Let us take, as an example, a plot 500 feet on each side, which will have an area of something less than six acres. From the center of each side, run a line through the plot. Take the intersection of these lines for the center of the circle. In this center plant a strong, smooth and round stake. Over this drop the loop of a rope which will extend 251 feet. To the other end of this rope fasten a strong pointed stick. With the rope extended, mark the places for the trees on the segment, *A*, and plant them before touching the interior lines. Then shorten the rope 30 feet and mark the places for the trees on the circle *B*, and plant them. Then shorten the rope 30 feet more, mark and plant on circle *C* as before. Then shorten the rope 24 feet more, mark and plant on circle *D* as before. Then shorten the rope 20 feet more, mark, and plant on circle *E* as before. Thus the circles are all planted, and from the dwelling in the center one can scarcely see three trees in line. The irregularity is there, and if vistas are wanted through the lines the trees can be left out which close it. Between these circles, with the planted trees to guide his eyes, a horse can draw a plow with as much ease as on a straight line. Circles *A*, *B*, and *C* can be planted with apple trees. *D* can be planted with cherries and the taller growing pears. *E* can be planted with plums, peaches, and the lower growing pears. The straight outlines of 3 sides of the plot can be planted with apples; the front side with that stately and beautiful fruit tree, the American Chestnut. Now, to an eye looking from the house, the interior circle will have a bare, uniform, and naked appearance. Therefore this uniformity should be broken, as in the drawing, by outlying spurs and peninsulas and islands, by plantations of low growing trees and shrubs. Next the circle could be placed a few dwarf pears or apples, or mulberries or quinces. Then could come blackberries and raspberries, and filberts and currants, and gooseberries and barberries. Then could come flat-beds of purple hazel and purple barberry, kept down by pruning. Then graded down to the level of the lawn could be the strawberries. In one or two of the round beds standing alone could be placed some rhubarb, the broad leaves of which are

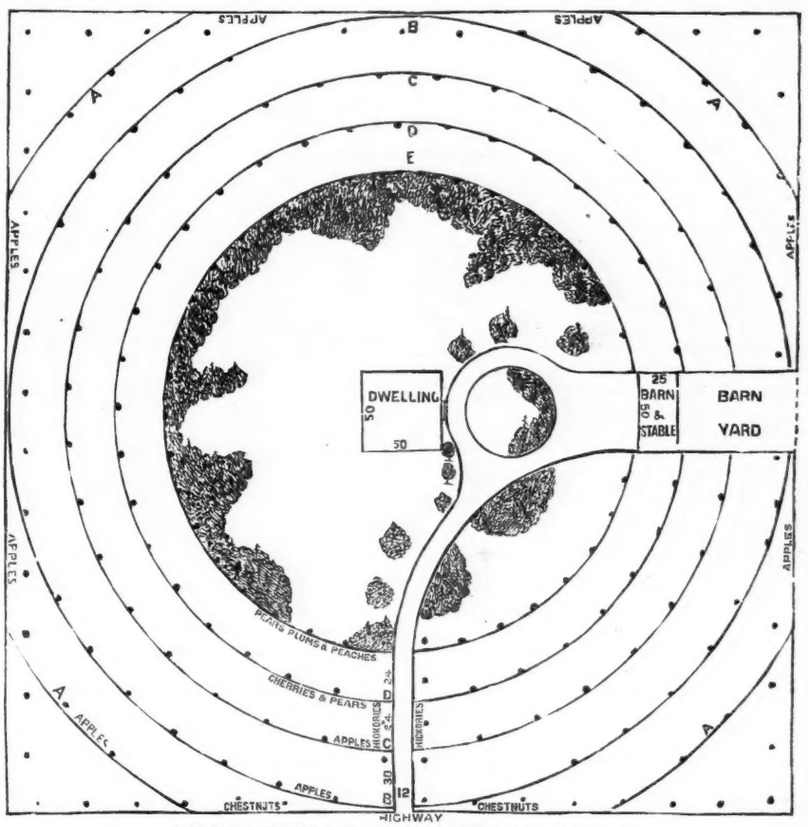
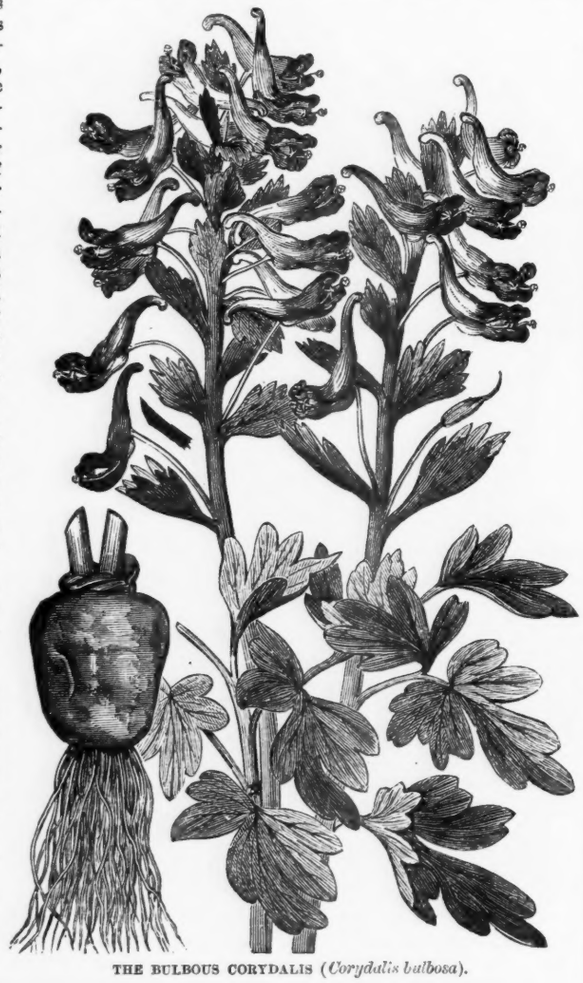


DIAGRAM SHOWING THE CIRCULAR METHOD OF PLANTING.

as ornamental as those of the Arum, and its spike of white flowers stands up in its middle like the flower of the Yucca. We have confined ourselves to fruits, but there is no reason why the lady of the house should not have scattered along the drives her groups of roses or bedding plants. In the circle between the house and the barn evergreen trees would best hide the latter. The carriage drive from the highway could be bordered with shell-bark hickories. Thus in the small space of five acres could be made a beautiful place, giving great pleasure to the eye, and furnishing all the fruits desirable for family use. It can be made, moreover, by any intelligent man, and does not need the aid of a landscape gardener.

The Bulbous Corydalis.

From the charming little plant with the uncouth name of Dutchman's Breeches, so welcome in the woods in April, to its gorgeous brother from China, that hangs its graceful strings of Bleeding-Hearts in our gardens in May, all of the Fumitory Family are pleasing. They have, as a general thing, handsomely cut foliage of a tender green, and their flowers have a peculiarity of form and a clearness of color that makes the amateur gardener say of each one "it's a good thing." We did not start with the intention of writing about it, but we may say with regard to one, the Plumy Bleeding Heart (*Dicentra eximia*) from the Alleghany Mountains, that, take it for all in all, it comes as near to being a thoroughly satisfactory plant as we expect to see. That is noted among other qualities for its long continued bloom. The one we would now speak of (*Corydalis bulbosa*) has an abundant bloom in early spring and is done with it. It may be said here that the Dicentras have two spurs, or lobes, to the flower, while in *Corydalis* there is but one, giving it a quaint one-sided appearance. The Bulbous Corydalis is a native of Europe and Asia and is thoroughly hardy. It has a solid bulb or tuber about as large as a hickory-nut; the stem, 6 or 8 inches high, has cut leaves, and at the top is a raceme of flowers of the size and shape in the engraving. A drawing can show size and shape, but the color must be left to the imagination. We may call it purplish-rose or rosy-purple, but that does not give an exact idea of the tint. As we looked out upon a closely planted bed of it in April, it occurred to us that we had not seen a more thoroughly spring-like tint—lilac does not describe it. It is the tint that suggests spring days, spring flowers, and—the spring fever. The plant keeps in flower two or three weeks, makes a strong leaf growth, and then having done its duty in giving us pleasure by its season of bloom and having provided for another next spring, all above ground soon disappears, to be thought no more of until another winter shall have passed, and spring has come around again.



THE BULBOUS CORYDALIS (*Corydalis bulbosa*).

The Clover Root Borer.

Mr. I. S. Peer, of East Palmyra, N. Y., sends a letter and a package of clover, both of which plainly show that he is very badly troubled with the Clover Root Borer. None of the insects are to be found in the honey-combed, and thoroughly eaten roots, but we have no doubt that the destruction of the plants was caused by the larva, or grub, of the beetle, known to science as, *Hylesinus trifolii*. This pest is rather new to us, but has been known in Europe for many years. Professor Riley thoroughly investigated the insect, and published his results, with an illustration of the beetle in its various states, in his Report for the year 1878. The *American Agriculturist* for November, 1879, gives an illustrated article on this Clover Root Borer. Mr. P., writes: "On examination, I found that I could with the side of my foot scrape the roots of the clover all together. These were entirely dead, or perhaps a leaf or two alive, but very small. The stalks that looked at all healthy, would not average four to the square foot. I had 21 acres, all of which was more or less effected, and I am now plowing it up for corn."—This is certainly a destructive insect, and its advent a serious matter. When it works in this way, in such destructive numbers, the only remedy is a total withholding of the clover crop, throughout the district. Half-way measures will do no good: there must be co-operation in the work by every farmer in the neighborhood. If one farmer continues to grow clover—or tries to grow it, he will merely provide insects to stock the fields of others, when they resume its cultivation. No direct remedy which will kill the insect is yet known, nor is it probable that one will be found, the application of which will be practicable to insects that work below the surface of the soil.

Water Cresses without Water.—Several persons in England have reported their success in growing Water Cresses in the garden. We gave, several years ago, Mr. Hibberd's method with pots and tubs, but this growing them in the garden will meet with more general favor. No definite directions are given; it is merely stated that the beds were sown sometime in summer, and that a bed sown in well prepared ground will continue for several years, as the plant reproduces itself from self-sown seed. The difficulty with us will be in carrying the plants through the hot, dry summer, and those of our friends who desire to experiment with Water Cresses in the garden, should select a place that is shaded during the hottest part of the day. Seedsmen generally have the seeds for sale.

Why Not More Currants.

Perhaps when we consider their real value, currants are more neglected than any other of the small fruits. Their value in the family is too well known for us to enforce, but their market value is greater than that of most, if not all other fruits. By this, we do not refer altogether to the money received for them, but to the fact that there are not so many drawbacks to getting the money at all. If currants are ripe they may be picked to-day, to-morrow, or next week, and must not, like the strawberry and raspberry, be picked by the clock. Currants sustain less damage in transportation; the delay of a train or boat by accident does not cause the loss of the crop; if the fruit does not sell within a few hours after it gets to market it will keep until the next day. As to the actual profit from an acre of currants we have no figures, but we notice that those who have had an acre are very apt to add another to it, which is quite as expressive as if we saw their account of sales. But the currant worm! Whoever finds that an obstacle should not cultive currants—or any other small fruits. We do not know of one of them that will yield profitable crops without care, and the currant requires on the whole less care—currant worm included—than any other. Buy some currant bushes, get good big ones; plant them up against the fence, setting them so close to one another that their stems will touch and soon interlock; acting upon the principle of "the more bush, the more room for fruit," do not cut them—in short, follow the too common treatment of this fruit, and we have every reason to believe that currant culture will not pay. This is not the method of those who are increasing their plantations.—*The Soil* should be as good as can be had, and especially free from excess of moisture; no fruit will give a better return for manure.—*The Varieties.* Our largest growers depend upon La Versaillaise, or as more generally called Versailles, and White Grape. So far as we have seen, these, of the true sorts—and this is important—will, under good culture, do all in size of fruit and productiveness that any currants will do, though it may be that some others may be found to prolong the season. There is so much confusion among currants, that if one appears to have desirable qualities it is difficult to obtain it true to name—not from intentional wrong on the part of the nurserymen, but currants are so much "mixed."—*Cuttings or Plants?* Generally those who have plantations have so much surplus wood from pruning that they are glad to sell cuttings at a very low rate; one can purchase these and plant them in a bed, or buy plants one or two years old. Of course the purchase of plants will give one fruit a year or two sooner, while the outlay will be more. Cuttings should be planted in fall, and it is quite doubtful if they can be had in spring. *Planting* is better done in fall, but may be done in spring, but the plants should be taken up so soon as the frost will allow, as they start into growth very early. If lifted after the buds have pushed, this young growth may be injured, if not destroyed, in transportation, to the injury of the future of the plants. In setting out the bushes, four feet each way is the least distance for healthy growth and comfortable working, while five, or still better six feet, will in the end give better results than to set close. At planting, some pruning may be needed, but this will depend so much upon the former treatment and present condition of the plants that no directions can be given. *The Currant Worm* is as likely to come upon young bushes as upon old ones; hence the plantation should be looked to daily, and if any ragged leaves are seen, look for the enemy. On small bushes much may be done by hunting for the eggs, which are upon the underside of the leaves, especially those near the ground. When the enemy is discovered, use

powdered White Hellebore, either dusting it from a bellows, or mixed with water, as we have described at the proper time, in Notes about Work.

The Raspberry Fungus.

So soon as the leaves of the raspberry and blackberry bushes, both the cultivated and those growing wild, have reached two-thirds their natural size,

THE RASPBERRY FUNGUS.

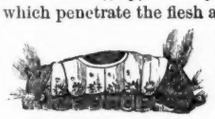
and sometimes before, they are frequently noticed to be covered on the underside with a number of large patches of orange color. This spring we have received numerous letters, containing specimens of the plants affected by this trouble with the anxious and important question: "What can we do; for this disease is destroying whole rows of our raspberry bushes?" The trouble is a parasitic fungus—a little plant which sends its fine microscopic "roots" through the substance of the young growing leaves, and after a short time breaks through the surface and develops a vast multitude of minute spores constituting the fine dusty powder with a rich orange color. This fungus, unlike the grape mildew and other similar and comparatively slow acting parasites, is so rapid in its development, and has its course so nearly run by the time it *shows* itself, that up to the present time no preventive has been found. So soon as a bush is seen to be affected—and it usually attacks the whole raspberry plant if at all—the best way is to cut it down and burn it at once, thus clearing the ground of a useless bush and at the same time destroying a vast multitude of spores—or seeds as they might be called—that would otherwise find their way to other bushes and there reproduce the trouble.

Horseradish Culture

There are certain crops that may be classed as "uncertain." There is a certain demand for them, but this cannot be increased, as the consumption is limited; and a small excess in the production, causes an over supply, and prices fall. Such crops are constantly fluctuating, the high prices obtained in a year of scarcity, induce many to grow them, and the next year will be one of glutted markets, and low prices. Again the culture will be abandoned by all but a few, and prices go up again, and so it continues, an alternation of extremes. Those who grow such crops in moderate extent year after year, no doubt make money in the long run, while the outsiders, who take them up only after a season of high prices, not only make nothing themselves, but prevent the regular growers from making it. Hops are such a crop, Tobacco to a certain extent another, and on a smaller scale, Horseradish. Just now, to judge from inquiries, there is likely to be another Horseradish boom; as many ask how to cultivate Horseradish, indicates that those who have never cultivated the crop, think of trying it; indeed, some know so little about the matter, that they ask where *seeds* of Horseradish may be had, and how much is needed for an acre! Such are evidently not aware that a Horseradish seed would be a curiosity, that few persons have ever seen. The plant blooms freely, but, in this country at least, fails to form seeds. Horseradish is always grown from sets, obtained in preparing the roots for market. These are about the size of an ordinary lead-pencil, and 4 to 6 inches long. As they should be planted "right side up with care," the lower end is cut with a slant, and the top square. These sets are to be had of the seedsmen generally. Regular market gardeners grow Horseradish to the best advantage, as they put it on the same ground with their early Cabbages or Beets, planting it between the rows. Early cabbages are set 18 inches apart in 2 foot rows, and the sets are put in midway between the rows, and as far apart as the cabbages; when grown between beets, those are in rows 18 inches apart, and the sets put in every two feet between the beet rows. When it is grown as a crop by itself, the Horseradish sets are put at the same distances, *i. e.*, 18 by 24 inches. When grown with other crops, it is kept down in the hoeing, until they are off, when it has the ground to itself. The sets are put in with a long dibble, taking care that the top of the set is about 3 inches below the surface. When grown between market garden crops it is always sure of a rich soil, and fine roots are produced; when grown by itself, the soil should be well enriched. It should always be dug in the fall or early spring, and never be allowed to grow more than one season. It may be planted any time during the month of May. In the family garden the same rule should be observed, *i. e.*, to always dig it after one season. If left longer it gets such possession of the soil that it is difficult to eradicate it, and it becomes a troublesome weed.

Stinging Caterpillars.

Notwithstanding that caterpillars have no stings, we every year have complaints from people who are "stung" by them. Even the great, green caterpillar, popularly known as "Tomato-Worm," has actually been accused of stinging, and is looked upon as dangerous on account of the ornament it wears at its tail end. But while caterpillars have no proper stings, several of them are not to be handled roughly, as they have very sharp hairs which penetrate the flesh and produce a disagreeable sensation similar to that caused by a sting. The hairs of some plants possess similar irritating properties, notably those upon the pods of a species of *Mucuna*, one of the Pea Family, called Cowhage, which name has been singularly corrupted into "Cow-itch." These hairs, when examined by the microscope, are found to be exquisitely sharp, and furnished with still smaller barbs, all pointing backwards, and tending to prevent the removal of the hair. A quite large caterpillar, the larva of the Maia Moth, is found upon the Oak trees; when full-grown it is about 2 inches long, and at that age bristles with much branched spines, which enter the skin very readily and cause much pain. But the caterpillar most complained of, and of which we have several specimens sent every summer, is popularly known as the "Saddle-back Caterpillar." It is so striking in its colors and markings, being quite unlike any other caterpillar, that it at once attracts attention, and as the discoverer is likely to wish to show the curious creature to others, he picks it up and finds that it is not so innocent as it looks. The engraving, from Packard, shows the insect of its real size. The body is reddish, with a very handsome light-green "saddle-cloth" spread over it; in the center is a broad elliptical reddish-brown spot, edged with pure white; a most striking contrast of colors. At the front and rear are pairs of projections or tubercles which are bristly with black hairs, which, when the insect is handled, cause the stinging sensation. This caterpillar feeds upon most fruit trees, raspberry bushes, and even on Indian Corn, of the silk of which it is said to be particularly fond. The perfect insect is a moth about an inch and a half across, of a rich, dark velvety brown, with a few small golden spots. It is never abundant anywhere.



SADDLE-BACK LARVA.

A Simple Wire Stretcher.

A correspondent in Virginia, sends us very neat sketches of a device for stretching wires in a vineyard, for a fence, or wherever else a horizontal wire is to be stretched tight. We have no doubt that this affair will do the work, and do it well, but as it is too much trouble to make it and to use it, and takes up quite too much room when not in use, we do not give it, preferring a much simpler stretcher that we have used for years, and which is as affective as any device can be. If we mistake not, we found it in use in the vineyards of Steuben Co., N. Y. It is simply a cylinder of hard-wood about a foot long, and perhaps 3 inches in diameter; this has a small hole in the center for the wire to pass through, and a hole near each end, to admit a half or three-quarter inch iron bar, these holes being bored in opposite directions. This piece of wood, which may be a section of a limb of an apple tree, or any other, sufficiently strong, and may be formed naturally, true enough for the purpose, and two iron bars 18 inches or 2 feet long, make up the whole machine. The manner of using is shown in the engraving. The holes in the post through which the wire passes, should be at least half an inch in diameter, for the convenience of fastening. The wire being made fast to the post at the further end of the row, is passed through the opposite one, and through the small hole in the center of the cylinder; the rods being in place, turn the cylinder gradually—two persons are handier than one at the work—and when the wire is sufficiently stretched, one holds the arms to keep all taut, while the other drives a wooden plug, made ready for the purpose, into the hole in the post. This should be driven in firmly enough to keep the wire from slipping, and when driven home should project beyond the post for 2 or 3 inches. Unwind the wire from the cylinder, give it a turn around the end of the plug, and the job is done. If it be desired to slacken the wires in winter, unwind the end from the plug, drive it out by means of an iron rod, at the other side of the hole, and the wire can be as slack as desired.

WIRE STRETCHER

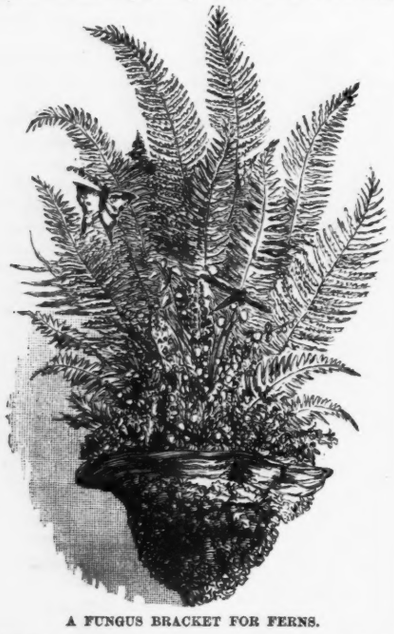
Liquid Manure for the Garden.—It is a well established fact that the liquid is more valuable than the solid excrement of animals. It is much quicker in its action, because all the elements are in a soluble state, and are, when applied to the soil, more uniformly distributed. There is a great waste of this valuable fertilizing substance partly from a lack of a proper appreciation of its value, but mostly from a failure to provide some simple and inexpensive means of saving and storing it. The extra cost of building the stable and grading the barn-yard so that all the liquid manure may flow through a channel to a tank or tight bottomed pond, is trifling; but when the provision has been made, and the fertilizing elements thus saved are put to use on the garden, near by, the gain is marked, and the returns for time and trouble are more than satisfactory. Try it for yourself.

THE HOUSEHOLD.

☞ *For other Household Items see "Basket" pages.*

A Fungus Fern Bracket.

There is no class of plants the individuals of which possess more beauty of form and grace of outline than ferns. They are generally and generously distributed through the rocky highlands and wet lowlands, and if these fine, delicate plants are not employed to lend their grace and beauty to the household, it is our own fault. It must be admitted that there is some work in fern-collecting, but with a little care it can be made a pleasant task. A large portfolio is the most convenient for gathering the ferns, which should be well supplied with smooth sheets of paper, into which the fronds, as their leaves are called, are to be carefully placed so soon as they are picked. If a basket or box is used, the delicate leaflets are apt to get crushed or broken, and if not kept wet will soon wilt and roll up, and are spoiled for pressing. After the portfolio is filled, or a sufficient quantity has been gathered, the fronds *with their papers* should be placed between other papers (newspapers will answer) and pressed. The simplest press is the best; putting the pile of papers under a board with a heavy stone or other weight upon it, is the ordinary and best method of drying and pressing plants. Those who do not find stones abundant can use instead, for a weight, a box containing old iron, or even dry earth, though in that case the box must be made very tight, by pasting paper over the corners. If much pressing is to be done it will make



A FUNGUS BRACKET FOR FERNS.

the work easier if a piece of hoop be fastened to the box as a handle to lift it by. If the box has a cover, and the whole is papered, the affair will look all the neater. The specimens will need to be changed into fresh, dry papers the next day, and at intervals until thoroughly dried. In changing the drying papers, do not disturb the ferns; they are to remain in the fold of paper in which they were first placed, and in changing, the paper with the plants is to be placed between dry papers, while the damp dryers are to be exposed to the sun for a short time. When dry, the ferns are to be put away in the folds in which they were dried, and kept under sufficient pressure to prevent them from curling up, until wanted for use. The dried fronds may be used for decorative purposes in various ways. One of the most attractive forms is given in the accompanying engraving, taken from Mr. J. H. Batty's new work on "Practical Taxidermy and Home Decoration." The design is a Fungus Fern Bracket, and requires a member of another family of plants, the Fungi. Those who go much into the woods will have little difficulty in finding specimens of this kind; they are found attached to trees, projecting like a little shelf not far from the ground. These are often called Agarics, an incorrect name; their proper botanical name is *Polyporus*. They grow with the smooth surface upwards, the reverse of the position in the engraving; are quite common in the woods, and some specimens are of themselves curious in structure and even beautiful in appearance. Having the fungus, it is to be mounted upon a shield, or back, made by cutting out a piece of thin wood in any desired pattern. The shelf-fungus is glued to this back near the bottom. The upper surface of the shelf may be covered with fine mosses that have been dried for the purpose. The moss should be glued on rather compactly, as it furnishes a bed into which the stalks of the fern fronds are stuck, and thus, aided by glue, are held in place. The arrangement of the fronds will depend much on the individual's taste, but, as a rule, the largest should be at the rear, with the smaller and more delicate specimens in the foreground. Fine grasses can be added, and here and there a butterfly may have seemed to have alighted upon the fronds, but to our taste simplicity is a prime element of beauty in all matters like this, and it is easy to overdo.

Home Topics.

BY FAITH ROCHESTER.

Bachelor House-Keeping.

I suppose everybody knows what "grass-widow" means—a woman living temporarily absent from her husband. I can think of no corresponding term to apply to a man in like condition, unless it is "grass-widower." I know of one who is just setting up his cabin on a northwestern prairie, prepared for a summer campaign of "breaking" prairie-sod. A boy of fourteen is with him as "chief cook and bottle washer." I feel a deep interest in their work, particularly in the house-keeping. The boy's success or failure in cooking, washing, etc., will bring credit or discredit to his mother—and that's me. I have lately heard the father inquire anxiously concerning his capabilities—"Do you know how to cook oat-meal?" "Can you make such graham bread as this?" "Does he understand the knack of making dried apples eatable?" "You know how mamma seasons the macaroni, don't you?" etc. Both are very fond of milk, and if they get a cow, or find good milk for sale close at hand, the cooking and eating business will be simplified. Milk goes well with almost everything that our folks eat, as we never use pickles, and vinegar very seldom. To make sure of cooking the oat-meal, cracked wheat, rice and hominy, properly, they have taken along a steamer made after the farina-kettle plan. They are directed to use one part oat meal, rice, hominy, or cracked wheat, to four parts of cold water in the inner kettle, with plenty of water to keep up boiling in the outer one.

To secure good graham bread, they have provided the best of graham flour and the dried "National Yeast Cakes." The cook will set a thin sponge at night, with half a yeast cake, and flour and warm water enough to make a large dripping-pan loaf (all they can bake at one time in their oven), and in the morning he will add sugar and graham flour until he has a stiff batter well beaten. This will be turned into the buttered bread-pan without kneading, allowed to rise quite light and then baked. It is pretty sure to be good every time, for the same cook has gone through the same movements many a time, simply helping his mother, but unconsciously educating himself to be a great help to his father in this emergency, and possibly to himself later in life.

To Make Dried Apples Eatable.

Concerning this fine art there is great lack of knowledge among the people. I don't know the various ways by which they go astray, but I do know that if you have good dried apples, and cook them properly, you may have delicious and wholesome sauce. I have heard of their being cooked in an iron kettle, and of course they were not liked. No rusty tinware is allowable to cook or keep any kind of fruit. Bright new tin, a porcelain kettle, or stoneware may be used. Look over the slices or quarters, removing not only cores, but decaying portions—those that have partially decayed while drying, and are black and of bad flavor. A few such slices spoil the flavor of the whole dish of sauce. If dried apples are not soaked over-night, three hours are not too long to give to their slow cooking. It makes no difference in the result whether they are soaked or not. Dried apple sauce is high in favor in our family. We use a variety of fruit, but none more than apples, in one form or another. Good apples, properly dried, come in well after the season for fresh apples is over. The cook referred to above, expects to cook a gallon jar nearly full of apple sauce at a time, for himself and his father. He will fill the jar less than a quarter full of the washed slices (if you soak them be sure and do the washing first, and then cook them in the same water in which they were soaked), and add cold water until the jar is three-fourths filled. After a time they will swell and threaten to run over, but they may be stirred down and will soon shrink to the original proportion. When they have cooked thoroughly soft, sweeten them with the best of sugar, and boil a few minutes longer. Nothing is better for flavoring apple sauce than good maple sugar. We always use the granulated sugar. We like to cook fruit in an earthen jar because it can be set aside and kept in the same vessel. It never imparts any taste, and is easy to clean. The gallon and half-gallon jars in which my butter often comes, prove very useful about the house, though I can return them when I choose. I have used the stone jars for years, and have never broken one by cooking, unless the fruit, or other contents of the jar, has boiled dry. They cannot bear sudden transitions from great heat to severe cold, or the contrary.

Soaking the Clothes.

I am afraid our inexperienced house-keepers, before referred to, will get into trouble by soaking their clothes too much. I suspect they will often have to use hard water for washing. The boy has seen me soaking the clothes over-night, sometimes lately with the idea that I was gaining time, but I think now that I have usually lost more than I have gained by the operation. A brief soaking in warm suds just before washing is much more effective, I think, than all night soaking in clear cold water. To soak clothes in hard water is worse than useless.

To Prepare Hard Water for Washing.

I cannot find definite directions anywhere, and perhaps no exact rule can be given, since water, with lime as an ingredient, has different degrees of hardness. Some soften a barrel of water at a time, by tying ashes in a bag—two or three quarts for each barrel, I have been told—and leaving this in the water over-night. The same ashes would not do for the next barrel, of course. Others make a white lye by boiling a kettle nearly full of ashes and water. This is added to the hot water in the tub, or, better still, to the water heating in the boiler. In the latter case, as the water heats, a white scum rises, which can be skimmed off, and leave the water clear and soft. Miss Parloa, in an excellent little book, entitled "First Principles of Household Management," gives very clear directions about washing, but concerning the use of hard water she only says "if the water is hard, add a little washing soda or borax." The most expensive way to soften the water is to use borax, but it is the most satisfactory method. It is a great aid in washing with soft water, and whatever is not taken up in softening the hard water, remains to make the cleansing of the clothes more easy and effectual.

Water Filters.—Impure water is perhaps the most common source of those diseases frequent at this season, and known as summer complaints. The hot weather favors the development of those low organisms that only the microscope reveals, but are at the same time very dangerous when taken into the system in any considerable quantities. At this season also water is the most scarce, and it often happens that other than the regular source of water, the well, is resorted to for water for household use. In all such cases, if one is not sure that the water is pure, it should be filtered,

and this can be easily done. Secure a quantity of charcoal and make it fine. Put the charcoal into a flower pot set in the top of a tall jar, and pour the suspected water upon the mass of charcoal. It should be observed that all the water passes through the bed of charcoal, and that not too rapidly. The best way is to have a tall vessel that is provided with a stop-cock or faucet for the drawing off of the filtered water below. But if such a vessel is not at hand, filter the water any way that it is possible; the point is to pass the water through the charcoal that the disease germs may be removed, and thus prevent them from getting into the system.

Yeast: What Is It?

In the process of fermentation of many substances, and in the making of beer, a grayish foaming mass separates and is known as Yeast. When seen under the microscope, this substance is found to consist of countless minute bodies, called cells—some of which are shown very much magnified in the accompanying engraving. These little bodies represent so many living, growing plants, and a globule of yeast that may be held upon the point of a pin is, so to speak, a whole forest of vegetable forms. These plants are very low in the scale of life, as their simplicity of structure would lead one to conclude. The method of increase,—which is very rapid—may be illustrated in the following way: Suppose we have a body like a link of sausage made of thin rubber, and is constantly enlarging in in all directions. After it has grown to a certain size, a string is tied around the center, and the two ends are literally "tied off" by a drawing down of the string, thus forming two little sacs out of the larger one. In the same way the two new cells, or sacs, increase in size, and they in turn are divided into two similar small ones that grow and divide, and so the process continues as long as growth lasts.

This is what takes place with the yeast cells, the time for the growth being very brief, and of course the division is not accomplished with any thing in the shape of a sting: it being self acting—a part of "the nature of the plant" as one might say. All growth, whether it be of the most complex animal, or the simplest vegetable, like the yeast plant, is of this same kind, namely: cell growth and division.

But what is the use of this plant which we have found to be so simple in its structure? It, like every other living thing, grows only when the necessary food for its consumption is at hand, and as it grows it produces certain changes in the substance upon which it feeds. It is in these changes—or the power to produce these changes that its value in the household lies. As the yeast plant grows, it decomposes its food, and, among other things, causes the escape of a quantity of carbonic acid gas; in other words it produces a fermentation. The most common domestic employment of fermentation is for the raising of bread. The yeast is added to the dough in the early stage of bread-making, and as it furnishes all the elements for the growth of the yeast plant, that soon begins to grow, feeding on the flour, at the same time producing a quantity of carbonic acid gas. This gas tries to escape, but is held in by the tenacious dough, and thus becoming filled with the forming gas, the dough is made light, and, in baking, the gas is still more expanded, making it, when baked, a healthful article of food. This yeast plant may be dried without losing its life; and as such it is a common article in the market, in the various forms of yeast. The "Indian Yeast Cakes," extensively used in the country, are composed of the yeast plant, dried with a mixture of Indian meal and an infusion of hops. Whatever be the substance used, the end is the same; the development of a fermentation to produce an evolution of gas for raising the dough, and thereby making the bread light and wholesome. It is then a little microscopic plant of the fungus group that does so much for our comfort and health, and even though some of these low plants are our worst enemies, we must not forget our friends.

THE YEAST PLANT.
(*Saccharomyces cerevisiæ.*)

A Summer Lamp Shade.

Even lamp shades have their times and seasons. In a large city the coming and going of different wares presents a subject for the study of the curious. Take this Lamp Shade as an example. About a fortnight ago, in passing a large lamp store, our attention was arrested by the display on some lamps in the window, of a shade that struck us as very pleasing in appearance. Soon after we saw in the window of a "fancy store" a lot of the shades of various colors. A few days ago we went to one of the principal stationers on some errand and found a great lot of the shades there, and were informed that they were "all the rage." To-day we had the latest evidence of their popularity in the appearance of salesmen upon Broadway with baskets of the self same shades. The shade is in itself remarkably pretty, exceedingly cheap, and not difficult to make. It is best suited to lamp shades of a globe-form, though it will answer for others. The material is tissue paper, which may be had in any desired color. To make the shade a square piece is required, a whole sheet or a half, according to the size of the lamp-globe. First fold the square piece once, which will make a fold twice as long as wide, as in figure 1; then crease this in the middle, *A, B,* which will divide it into two small squares, *A, B, C, D.* Begin with one of these squares, that at the right hand, fold *D* over to *A,* and it will give the crease *B, C;* then fold *B, D,* over upon the line, *B, C,* and it will give *B, E.* Next carry *D* over to a point half way of the upper edge of the next square, to *H;* this will give the line, *B, G.* The folding is to be done in such a manner as to make a sharp crease each time. Having creased the right hand square, as shown in figure 1, treat the left hand one in the same manner, beginning with the fold from *B* to *F.* When this is done, turn the paper over and fold between the present creases, in the opposite directions; this will have the effect of folding it like a paper fan. When the folding on this side is finished, the whole will appear like figure 2. Now carefully open the whole, and you will have a funnel-shaped plaited affair—which is to be held by the center and carefully drawn through the hand several times, increasing the pressure upon the paper each time; this is to fill the paper with innumerable irregular creases, and to give to the shade that peculiar crimped, crape-like appearance that constitutes its special beauty. When completed, the shade appears as in figure 3. When used, the top or point is to be cut away sufficiently far down to give an opening of the required size to fit it to the lamp-globe. The shade in use is shown at figure 4. It has a beauty quite remarkable when we consider the simple means by which it is produced, and it is useful as well as beautiful; the lamp adding greatly to our personal comfort.

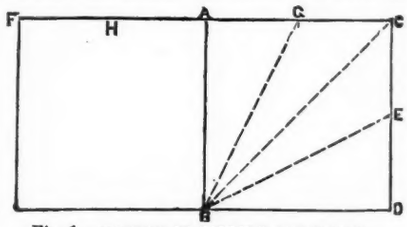


Fig. 1.—METHOD OF FOLDING THE PAPER.

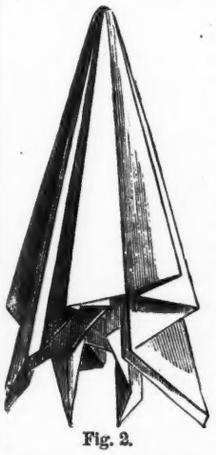


Fig. 2.

Progress in the Kitchen.

To the old housewife in her declining years, perhaps nothing is more amazing than the great changes that have taken place in kitchen furniture, and methods of doing cooking, etc., since she was a girl, fifty or sixty years ago. Our grand and great grand mothers with a crane, some pot-hooks, and a brass-lined skillet or two, worked over the blazing open fire-place, until their faces were almost as red as the fire itself. They did not dream of the perfect range of the present day, in which the heat is economized, and only allowed to cook that which ought to be cooked. When baking was to be done, a great fire had to be built in a great oven, and after the bricks were heated, the fire and ashes were removed, and the bread, cake, etc., placed in, after the proper temperature had been obtained. Now everything is so nicely arranged, that without getting overheated, the cook can do her work, and not a particle of smoke need escape into the room. Instead of the brass kettle with its constant scouring to keep it clean, we have the tin or porcelain lined stew-pans, kettles, etc., which to keep them clean only require the simplest of washing and wiping. At the present day, there is a handy little utensil for the doing of each of the simplest things in the kitchen—a list of which would be a long one. From the flour sifter, through all the processes of bread-making, to the handy toaster, everything seems complete in labor-saving aids and helps. Contrast the safe hanging lamp, with its abundant and cheap light, with the miserable tallow dip of a half century ago, which the woman made herself, and was constantly snuffing that it should not go out in smoke. Even in the matter of wash-day appliances, etc., the contrast is fully as great; instead of the old pounding, and hand-wringing, the whole work is done by machines that are easy to run, and do the work quickly, and in a thorough manner. With all the inventions and vastly superior methods of doing the work of the house, are our soups, and breads, pies and sauces, much better than those our grandmothers made?—They may not be, but the time spent in making them is shortened. They gave their minds, and too often we may add with regret their bodies, to the work of the kitchen, while with the same house to keep, the woman of to-day can spend a portion of her time in the library. The cook-room may be "a laboratory, where a fine chemistry can transmute grain cells and meat fibre into the fuel of a finer flame, the support of a richer flesh and blood, abler and stronger to do, than flesh and blood were of old." In the material progress of the age, the means for lightening the labors of the kitchen, as well as the various duties of the household have not been forgotten, and this is as it should be.

Fig. 3.

Fig. 4.

BOYS & GIRLS' COLUMNS.

The Doctor's Talks.

Some boys have asked me to tell them how to make a Balloon. I wish they had reminded me of it sooner, as I might have talked about it last month, and you could have had your balloons ready for the Fourth of July Celebration. I believe in balloons for the 4th.

BALLOONS AND CHINESE LANTERNS

are a great deal better than crackers and fire-works to celebrate with. They do not cost so much to begin with, the lanterns will last from year to year, though I must admit that balloons are not very lasting; to be sure they are not dangerous, and do not make a bad smell, but we shall by and by learn to show our patriotism without

Fig. 1.—STARTING THE BALLOON.

either burnt powder or burnt fingers. In former times people used to always speak of them as Air-Balloons. I recollect that when I was a mere youngster, I heard some old people talking about an *abaloon* that was to go up at some place, and I was in great mental distress to know what the wonderful thing might be, until I could reach home and have it explained that it was an Air-balloon that was discussed. You may think that these "Talks," where we have been trying to look into the why and wherefore of various things, is not the proper place for 4th of July and balloon talks.

WHY DOES A BALLOON GO UP?

we might answer this by saying that all balloons do not go up, and none will do so unless certain laws that we have been talking about are observed. We may look upon a balloon as a mere toy, to afford amusement, or as a piece of apparatus for illustrating some of the facts of science. I do not know why we can not regard it as both. If you wish a body to rise through the water you know that it must weigh less, *i. e.*, contain less matter than the same bulk of water. For a body to rise in the air it must weigh less than the same bulk of air. We have not yet had much to say in our Talks about Air and other gases, but I suppose you all know that air has weight. If a vessel holding 100 cubic inches with the air thoroughly taken out of it, is weighed, and then the air is let into it, and the vessel is again weighed, it will be found to be heavier than before by 30 grains. That is the average weight of the air—100 cubic inches weigh 30 grains. If we imagine a column of air one inch square at the earth, and reaching, of that size, all the way, as far up as the air extends, which is supposed to be about 100 miles, that column would weigh 15 pounds. A balloon then must in the first place be of very light material, and then must be filled with

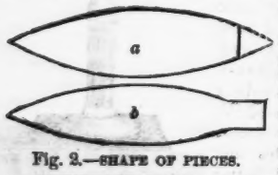


Fig. 2.—SHAPE OF PIECES.

SOMETHING LIGHTER THAN AIR.

The lightest gas known is Hydrogen—that is about 14 times lighter than air, and is on some accounts the best for filling balloons, and has been used a great deal for that purpose. But there is another law that prevents it being the best material for balloons, and that is the law of diffusion of gases—sometime I may talk to you about this; suffice it to say that gases of unlike weights, when separated by a porous partition, tend to mix; the heavy gas passes through the partition into the lighter one, and the lighter gas passing into the heavier one—and the lighter gas will pass through as much quicker than the heavy one, as it is lighter than that. So it is very difficult to hold hydrogen in a balloon. For this reason, and for its greater cheapness, illuminating or street gas is generally used, and as this is several times heavier than hydrogen, the balloon is made larger. But

IN THE FIRST BALLOON,

neither of these gases were used. The first balloon that was made did not go very far. It was of silk, had square sides, and went only up to the top of the room. When hydrogen gas was first discovered, it was tried in paper balloons, but they would not hold it. Two Frenchmen, brothers, named Montgolfier, were paper-makers. They tried hydrogen, and it would not work; then they tried to invent another gas by burning wool and straw, and that did answer. But it was not the gas from the straw and wool that made the balloon ascend. In burning these, the air was heated, and as a given bulk of hot air is lighter than the same of cold air, the first that went up was a hot air-balloon, though it was then thought to be due to the gas from burning wool. In making a balloon for our purposes, we use paper and hot air. We will not give any more of the early history of balloons, but go on

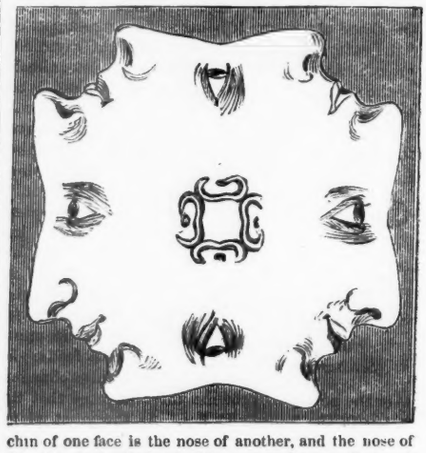
WITH MAKING THE BALLOON.

The materials needed are Twine, Paper, Flour-paste, and a brush to put it on with, a piece of willow or rattan for a hoop, a few feet of fine wire (copper is best, but iron will answer), some bits of sponge, and a few ounces of alcohol. Besides you will need a lot of old newspapers and some patience and skill. The sheets of tissue paper are 30 by 20 inches. As neither of these lengths is enough for a good-sized balloon, they should be pasted together, two sheets joined by their shorter sides, will make strips 60 by 20 inches. Our balloon, fig. 1, if 60 inches high, will, if a globe, be 180 inches in circumference, that would require 9 strips, but as we do not want it to be quite globular, and an even number of strips, as we shall presently see, are required, 8 pieces will be better. We shall want, then, 16 sheets of tissue paper. It will be safer to have a few extra sheets to make repairs in case of accident. The balloon may be all of one color, but it will look better of two, white and blue, or white and red are the most pleasing; or all three may be used, three strips each of red and white, and two of blue, or three each of white and blue, and two of red. In procuring the paper, see that there are no holes in it, or, should any be discovered, they must be stopped by pasting a small piece of the same paper over them. Use well-boiled smooth flour paste; it is a great deal better than gum, which dries hard and will crack when bent. Paste the sheets together in pairs, lapping them about half an inch. When these are dry you will be ready to cut out to the proper shape. If the balloon is to be a globe, the pieces will be of the shape of fig. 2, *a*, each with the end cut off to form the mouth. But a pear-shaped balloon is handsomer and easier to manage, and I think altogether better. For this the pieces have the shape given in fig. 2, *b*. If there is any rule for cutting out the parts or gores, I do not know it. In talking about making a balloon, as in many other matters, I have to go back a great many years, and, as a sailor would say, "overhaul my memory." Indeed I found that there were so many points about making the balloon, that I could not recollect about, that I went to work and made one, in order to be sure I was right. To get the right shape, then, for the parts, take a piece of paper, 60 by 20 inches, fold it lengthwise, and mark out a pattern. When it is to your liking cut it out, and use it to cut the tissue paper by. If you have large and sharp shears, all 8 pieces may be cut at once; otherwise you must cut fewer at a time. Next comes the most difficult part, the pasting. Take it easy, and don't get hurried or fussy over it. Tissue paper, when wet with paste, is very delicate and frail, and will tear very readily. Be careful with the paste, and should any get upon the paper where it is not needed, wipe it off gently with a cloth, and let the place dry before another piece of paper is laid upon it. Having arranged the pieces as you wish the colors to go, you will begin to paste. Lay down a piece of the tissue paper, then lay another upon it, with its edge half an inch within the edge of No. 1. Put paste upon this projecting half inch of No. 1, and turn it over and paste it upon No. 2, begin at the curved part, the top of the balloon, and paste the edge over a few inches at a time. When the whole edge has been pasted, lay piece No. 3 upon No. 2 in the same manner, half an inch back from the edge. If the pasted edge of No. 1 was from you, that of No. 2 will be towards you; this being done, lay No. 3 on No. 2, and paste in the same manner, and go on until all are pasted together. When you have pasted the last, No. 8, you will have your balloon, folded like a fan, with alternate edges, in and out. Now comes the most difficult part, pasting the last edge—pasting the edge of piece No. 1 upon that of piece 8. By bending the other folds out of the way, you can, without much difficulty, paste the edge from the top down to the widest part, about a fourth of the way; then stop and let it dry—being sure that all the pasting is perfectly dry, you then unfold the balloon, *i. e.*, take out the plaits. Now take a piece of cloth of some kind, glazed cambric or calico is best, cut out a circular piece about 2 inches across, and put this on the inside, where all the pieces come together, when that is dry, paste a similar piece of tissue paper on the outside. Now having the balloon unfolded, you will find but little difficulty in closing up the rest of the last seam. Let that dry, and by means of a large needle you can put a strong thread or small cord through the piece of cloth in the top, and make a loop to hang it up by. When hung up you can put in the hoop; this is to be as light as possible; a small willow, split if not small enough, a split rattan or whatever is most convenient to make the lightest possible hoop. Cut the mouth of the bottom even, and put in the hoop, pasting the edges of the paper over it. Stretch a very fine wire across the hoop in two directions and the balloon is done.

TO SEND UP THE BALLOON.

Before starting out, see that there are no parts of the balloon that stick together, and that all the folds are out. You will need two bits of sponge about the size of English walnuts. One of these should be securely attached to a fine wire about 6 inches long. The other sponge will need no wire, but an old tin or other plate will be well to hold it. Of course you will need your small bottle of alcohol. Let one stand on something that will allow him to hold the balloon well up from the ground. Wet the loose sponge with alcohol, not to drip, put in on the plate and set fire to it, holding the balloon over the flame so that the hot air will rise into and inflate it. As soon as the balloon will support itself the one who has held it by the top lets go and leaves it in charge of those below. One now wets the wired sponge with alcohol, quickly fastens its wire to the cross wires of the balloon, having it well away from the burning alcohol while doing it. As soon as secure, light the alcohol on the sponge on the balloon—hold on a second until you feel sure that it will go—then let her sail. It is very easy to do but it takes a long while to tell. In sending up a balloon, select a place where there can be no danger to barns or other buildings should it fail to go up, also a place where the balloon can not be caught by trees or otherwise before it gets above them.

Picture Puzzle.—How many faces are there here is a question that many will ask when they see this odd looking picture. Our artist sometimes gets a strange notion into his head, and don't you think this is a-*head* of anything in the way of a combination of heads? The



chin of one face is the nose of another, and the nose of the other is the forehead of the one, and so on all around the picture. What a funny looking person he would be that had such a combination head. It might be good for a school teacher, as he could then look in all directions at once; and again, what a singing school such a head man would make!

Our Puzzle-Box.

DROP-LETTER WORDS.

1. —b—t—m—o—s.
2. —o—o—r—p—y.
3. —r—g—n—l—r.
4. —n—e—t—e—t.
5. —r—t—r—l—y.
6. —u—m—d—o—n.
7. —e—m—f—c—s.
8. —e—u—e—n—e.

OPPOSITES (*Geographical*).

(*Example—Keep still.* Answer—*Rome.* If you *roam* you don't *keep still.*)

1. Back sea.
2. You are indebted to B.
3. Wide-awake solid.
4. Johanna's daughter.
5. Brother, you speak truly.
6. Shortcoming.
7. An unhappy vowel.
8. No pear.

ADOLPH M. NAGEL.

MIXED PROVERBS.

(In the following sentences are five well-known proverbs, displaced. Transpose the words and make the original proverbs: every word must be used.)

Where's the mother of brevity?
There's a time for wit and invention.
The soul is no light necessity.
Many a man will wait.
Hands make way! There's tide of work.

DOUBLE ACROSTIC.

The initials name a well-known bird, and the finals, an animal.

1. An oriental tree.
2. A man's name.
3. An ingredient of plum cake.
4. One of the tortures of the Inquisition.
5. A fruit.
6. A country in Europe.

EFFIE.

CHANGED HEADS.

(Change the first letter each time.)

1. First take a certain arrangement of rope; then change its head and make
2. Something very useful in carrying Saratoga trunks to the fourth story.
3. Again change the head and make something without which
4. Would be of no use.
5. A person.
6. A bad thing to get into.
7. What every freeman has.
8. Compact.
9. A number.
10. "Good night."

CROSS-WORD.

My first is in rampart but not in defence,
My next is in income but not in expense,
My third is in ocean but not in the sea,
My fourth is in coffee but not in our tea,
My fifth is in pitcher but not in the jug,
My sixth is in tumbler but not in the mug,
My seventh is in fragment but not in a rag,
My eighth is in satchel but not in a bag,
My ninth is in cricket but not in grasshopper:
My whole is a mixture of zinc and of copper.

PI.

Heret 'saw cone a codort, how, nhew saked thaw saw dogo rof quotessimo, tower cakb; "Who od ouy pupesso I nac letl sunsel I wonk thaw sall het quismoot?"

NUMERICAL ENIGMAS.

1. I am composed of 28 letters:
My 15, 20, 2, 3, 12, are certain birds.
My 3, 8, 7, is a kind of sauce.
My 16, 9, 2, is clamor.
My 18, 25, 8, 4, 3, 27, 21, 28, is a number.
My 11, 14, 15, is to dress.
My 17, 19, 23, 21, 22, is a leather strap.
My 13, 12, 1, 10, 17, 6, is abatement.
My 5, 24, 11, 26, is scattered.
My whole is very excellent advice. MARY A. E.

2. I am composed of 18 letters:
My 13, 14, 9, 15, 5, 16, is a body of troops.
My 17, 1, 8, 16, 4, 18, is a number.
My 5, 6, 15, 3, 2, is an animal.
My 12, 10, 7, 11, is to mend.
My whole may be found on the map of Pennsylvania.
JOHN M. M.

TRANSPOSED PROVERB.

(Readjust the letters to form the proverb.)

He is bent to copy his style.

METAGRAM.

In a word of five letters you may find three verbs, four nouns, two pronouns, a preposition, an adjective, an article, and an exclamation; among the nouns are a fish and a tree. What is the original word, and what are the different words formed from the five letters.

ANSWERS TO PUZZLES IN THE MAY NUMBER.

CHARADES.—1. Dilemma. 2. Menhaden. 3. Driftwood.

NUMERICAL ENIGMAS.—1. Honesty is the best policy. 2. The Lord is my Shepherd, I shall not want.

ALPHABETICAL ARITHMETIC.—1703)95482640(56067. (*Key*—Large Knobs.)

DOUBLE ACROSTIC.

Sing—Song.

S—pacion—S
I—ntagli—O
N— atlo —N
G— an —G

ANAGRAMS.—1. Contumacious. 2. Asseverations. 3. Potentates. 4. Superscribed. 5. Validity. 6. Predetermined. 7. Archbishopric. 8. Foreshadowing. 9. Metropolitan. 10. Greensward.

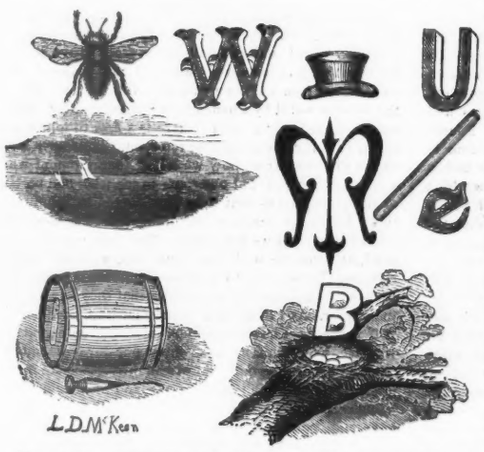
DECAPITATION.—Wheat, heat, eat.

CROSS-WORD.—Misfortune.

PI.—A remark of Patience Reville is at once luminous, monitory and timely: "Respect the embarrassment of any honest conscience which doubts, which seeks, which likes better to rest in what is vague, and even to contradict itself, than to disfigure the unknown truth by giving it features fixed and perhaps unfaithful."

METAMORPHS.—1. Yawn. 2. Beryl. 3. Long. 4. Forty. 5. Home. 6. Villain. 7. Convex. 8. Alcohol. 9. Bread. 10. Clay.

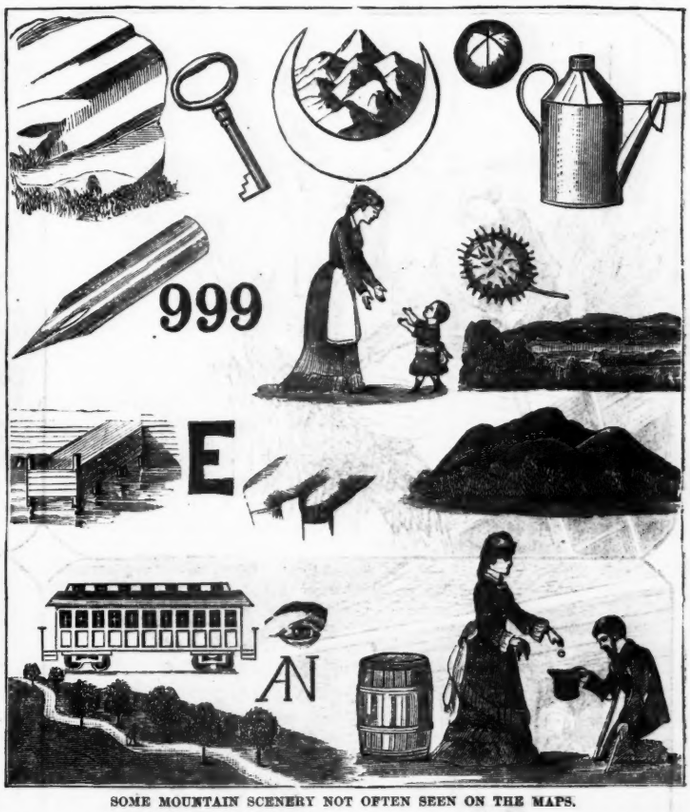
ILLUSTRATED REBUS, 476.—Accumulate information and increase wisdom, but above all acquire integrity and honor.



No. 478. Illustrated Rebus.—Wholesome advice to every one and worthy of study here, and much practice every day.

A Trip Over the Mountains.

The River Hunt, judging by the many letters from our readers, old as well as young, was a pleasant and perhaps an easy journey. With the warm weather upon us, it will be just the thing to change the direction of our rebus wanderings, and "take to the mountains," in the hope that a trip over some of them will refresh us in more ways than one. There has been quite an excitement over No. 1 of late years, especially among those men who are anxious to go into new mining regions where it is hoped that a vast amount of gold and other precious metals can be found. Among these mountains (which, by the way, are not called mountains), the Indians have frequently made much trouble, so that at times the miners' lives were in danger. There are very few boys and girls in these mountains, and perhaps we had better hurry away before we meet with any mishaps.—Let us now take an imaginary flight,—suppose ourselves carried across the seas—to a foreign land, a peninsula, and a peculiarly-shaped one at that. These mountains (No. 2) are not of great hight; the highest points being about 10,000 feet, or nearly two miles. None of the peaks of the range are covered with snow and ice the year round; there is here no point of perpetual snow, such as we may find before we reach home. Where these mountains come near the coast of the great sea, their sides are remarkably high and steep. Two famous volcanoes belong to this range, about which volumes of interesting things have been written.—Leaving these mountains, and journeying by foot, or perhaps better, by rail, for a number of hundred miles, we will come to No. 3—a range which encloses a country like a great hoop, or semicircle rather, on its north and eastern boundary. One of the peaks is so high, and the region of these mountains so cold that there is a glacier or river of ice which runs—of course slowly—down the mountain side and melts in the warm valley below. These mountains are mostly clothed with woods for half the way up, after which are mostly rocks and snow and ice.—No. 4, from the name, ought to be 240 thousand miles away from the earth, but they are only a small part of that distance from us. It is a considerable of a tramp to go to them, though, and they are in a land that is not very well known. It may be because they have been so little explored that they are named as they are. We can not be expected to be very familiar with mountains that no one else knows very much about.—No. 5 is a range that separates two great countries, which have been quite closely associated at certain times in the history of the two nations. The mountains consist of two distinct chains or ridges. The slope on the northern side is gradual, and covered with fine pastures, but on the south it is frequently very steep. Many parts of the mountains are of sufficient hight to have their heads covered night and day and all the year round with white caps of ice and snow. There are as many as a hundred *passes* or places through which persons can go from one side of the mountains to the other—from the country on the north to the more sunny land on the south.—No. 6 runs almost parallel with a great river, and is situated in the central portion of a great country, the name of which is perhaps most familiar to young people—and old folks too—about Thanksgiving time. In going from the capitals of two large countries, a traveller would go through one of the few passes in this mountain range.—As we return to that portion of the face of the earth—what a wrinkled face! Mother Earth must be very old—where most of our young readers live, we come across another range of mountains, and find our No. 7. There are a number of neighboring chains which run in much the same direction which we will not consider. A large river of the same name runs among these mountains, and afterwards flows into the longest river in the world.—No. 8. If we return to somewhere near where we started—at least the nearest to No. 1 since we left it to take a mountain tour of the world—we shall find a long and very difficult range to climb, but one which would bring us far into the upper air, because it contains some of the highest peaks in the world. But we can not stop to go the whole length of this chain, for we have one more, and that the most important in size that we have found. It is not far from where we started, and its name can be easily made out from the map which illustrates the subject. We hope that the hasty journey—flying trip we might call it—has not made you so tired on these warm July days, that you may not wish to go with us again.



SOME MOUNTAIN SCENERY NOT OFTEN SEEN ON THE MAPS.

Something About Glass.

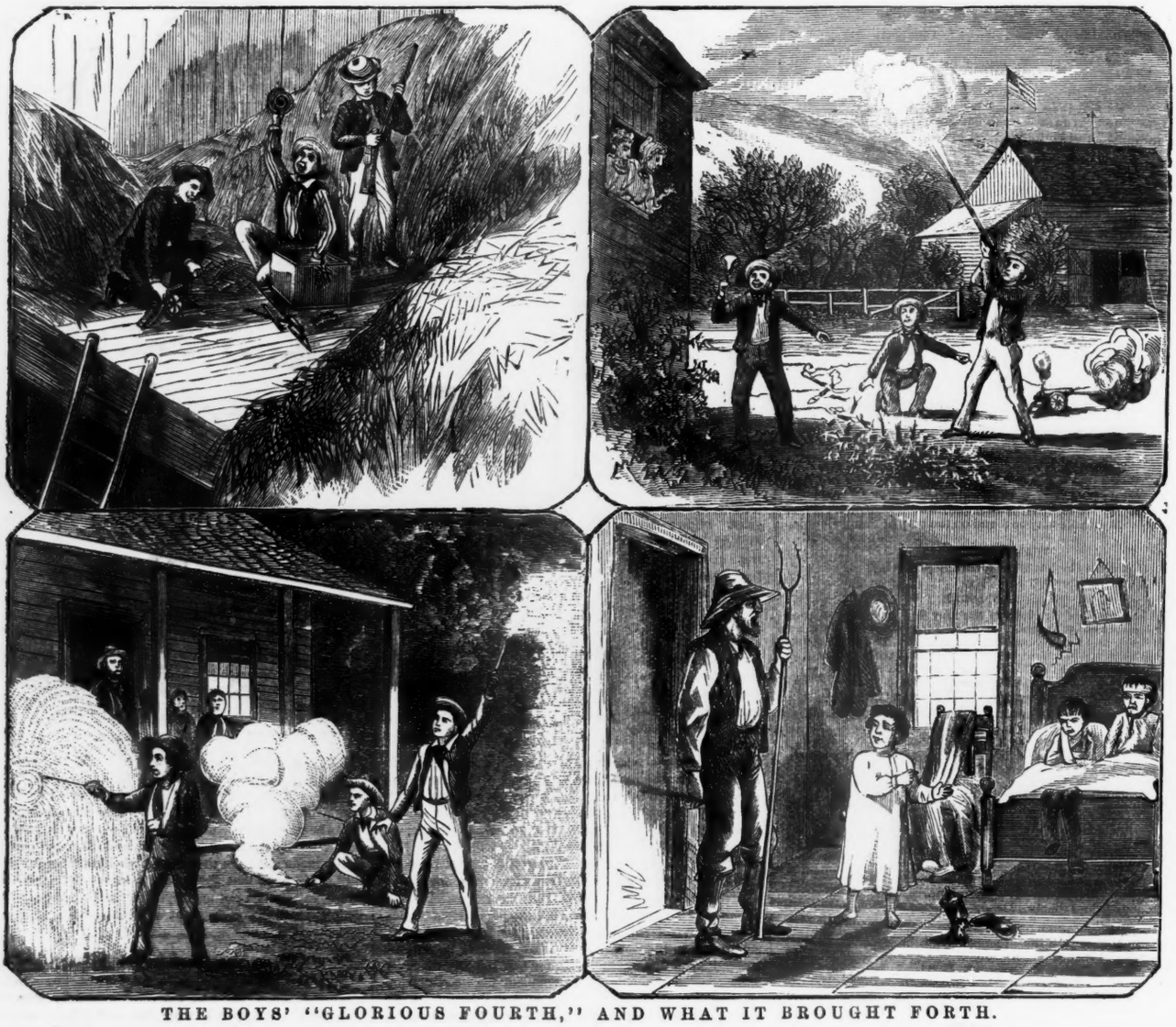
Some boy writes to "The Doctor," asking how window glass is made so flat and smooth "especially those in the large windows of store fronts." There are two kinds of window glass, one called "cylinder" and the other "plate"-glass. All the large panes are plate-glass, as the size of cylinder glass cannot be increased beyond a certain point. In this kind of glass a cylinder is blown; those who have been in a glass house—and I advise all of you, whenever you have an opportunity to visit one and see how this wonderful material is worked—know that to make a cylinder, a globe is first blown. This is then worked into a cylinder, by rolling it upon an iron table; after the cylinder is made its ends are cut off, and it is divided lengthwise and flattened out to form a flat, smooth sheet. All plate glass is cast; a polished iron table has ledges at the sides, as high as the thickness of the plate of glass. The melted glass is poured upon this and spread and flattened by a copper roller. The plate is then annealed; that is, put into a very hot furnace, which is so arranged that the glass will cool very slowly, in order that it shall be tough when at the end of a week or so it is cool. But the glass is now dull and rough, like that which you see in roofs and sky-lights. To become the beautiful plate-glass it must be ground and polished. The plates are so arranged that they may be rubbed together, one upon the other, by machinery. First sand and water are placed between them, then emery of different sizes, and after being ground with the finest emery, they are polished by rubbing them for some time with some kind of polishing powder.

The Day We Celebrate.

If there is any day in the year upon which the average Young American does not have to be instructed as to the time of its coming, that day is Fourth of July. The very air we breathe from the day we are born fills us with the spirit of the Independence Day. The coming "Fourth" reminds me of one in which I took an active part some years ago, and one, though without any striking events, that my memory has not allowed me to entirely forget. We knew it was coming, and when I say *we*, three young farmer lads—no more and no less—are included. The almanac had been looked at more than once to see how time was progressing, and we fully agreed with it when it said all along through May and most of June that the days were getting longer. They seemed longer and longer even up to the very day of the celebration—and that opened early and closed late. What fun it is to get ready for any unusual "doings"; and when you add to it the happy thought that not a soul knows anything about it except the few companions of your choice, how full of real, solid, silent delight the little youthful heart must be. For this particular occasion we had come home early from school, and done extra work for weeks for the money we should get, or, to look beyond the cash, the sport that our toil would bring; all of us were glad to get an errand from any one who was "good pay"; and they all, as I look back now, understood the motives which led us to such an outward show of industry.

It was not later than the middle of June that we formed ourselves into an investigating committee on fire-works, and visited the neighboring village in a body. How we did look at those store windows where fire-crackers of all sizes and colors were displayed to catch the eye, and finally the pennies, of just such investigating committees as mentioned above. We bought our things at one time or another as the funds came in; but we were so patriotic that we all concluded to buy of Postmaster M.; first, because he had been a soldier and had lost one leg, and secondly, his stock of goods appeared to be the best. Our pyrotechnics (a pretty big word for fire-works), as fast as purchased, were by common consent stored in the loft in the barn. It may be that we had an idea that nobody knew anything about what was going on, and we wished to "keep things hid." This storing of fire-works in the hay in the barn is just the wrong thing to do, and if any young reader is led to do the same thing through my experience, I shall wish I had forever kept still on this point. Whatever you do, remember, as I did not, that barns are costly, hay is easy to set on fire, and fire-works are still easier to burn, and then the temptation is so great that some thoughtless boy may touch a match to that which will make a funny noise when it goes off.

The artist has helped me to show my nieces and nephews, how things looked the day before the Fourth when the *Celebrators* were gathered for the last time to look at the purchases, see that they were all there and in good shape, and also to make plans for the morrow which had been so slow in coming. This was the joy of anticipation, but with it was mingled that stillness that the time and place demanded. Of course we went to bed in much that fevered state of mind and body that thousands of boys all over the land will do this year; and passed as long and sleepless a night as boys always do on July 3d. The morning of the "4th" was a fine one, and the sun rose without a cloud—the first sunrise we had seen for some time. The second scene lets the young readers into the activities of the early morning, but of course it can not show the noise that was being made, or express the utter surprise of the dog to see us out so early in such a peculiar and excited state. It was not our intention to make a quiet day of it, and we started out accordingly. We broke the silence of the morning, and our secret planning for weeks was exposed, with loud reports of small cannon and other fire arms. We had an audience at the window so soon as the exercises began. The firing was kept up until we concluded that the day had been well opened, and after taking a late and large breakfast we concluded to let matters rest until the heat of the day was over, and under the cover of darkness resume the exercises, as a better showing might then be made. Night came after we had had a day at fishing in the brook by the woods, where we had more bites from mosquitoes than anything else. The third scene gives an idea of how we finished up the day, and by the looks it might be supposed that the Celebrators were pretty well used up too. The hand that fired the overloaded cannon had been lamed, and was withdrawn from active service. The eye that had too closely watched the spattering and treacherous fuse had been dimmed, and was cut off from the outside world by a bandage, wet in cold water. But so sure as there is a "Fourth" there is a *fifth* to follow, and in our case it came altogether too soon. The fourth scene shows to some extent how we felt at that moment when a near relative called at our room to see what had become of the young hands that were accustomed to help him in the field during the morning hour before school. We looked tired, and we felt worse. The boy with the sore head, and the one with the lame arm, were the last to rise and the slowest to acknowledge that, after all, the Fourth of July was the hardest day that they had seen for just a year. As I look back to that morning, tired, sleepy, stiff and sore, I have to wonder at the seeming absurd way we, as American lads, show our love of country. Why is it that the young mind can not associate a more quiet time with "the day that our land was made free?" Whatever may be the truth of the case, the boys and girls will continue to celebrate the Fourth, and the dull, aching, Fifth will follow to remind them, as it did me, that the freedom the day allowed, leads into bondage, because I was bound with a towel. UNCLE HAL.



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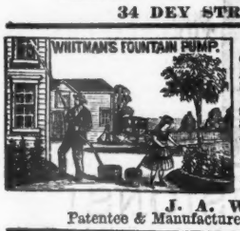

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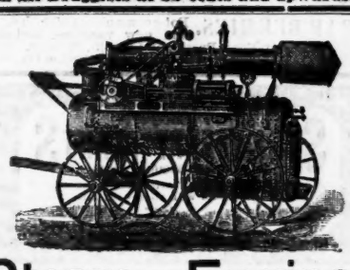

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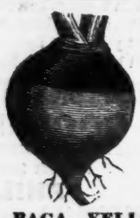

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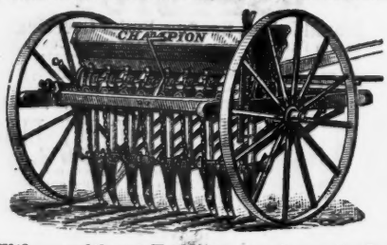

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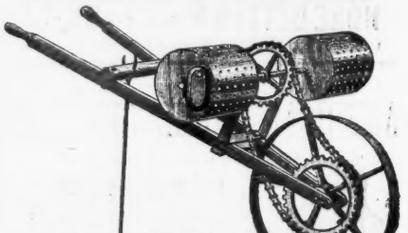

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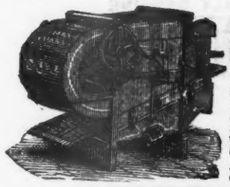

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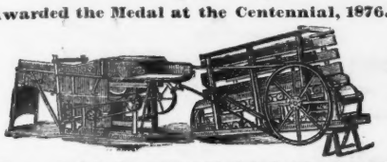

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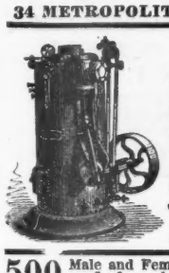

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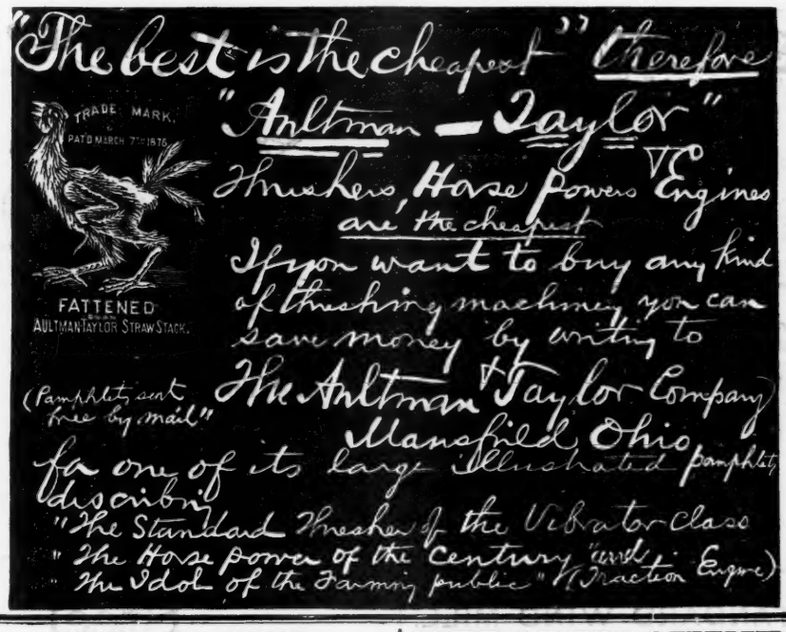
500 Male and Female **Agents Wanted immediately** for an honorable, light, local, *paying* business. An article of consumption in every family. Large profits. Samples free. C. L. VAN ALLEN, Albany, N. Y.


"The best is the cheapest" Therefore
"Aultman-Taylor"
Threshers, Horse Powers & Engines
are the cheapest
If you want to buy any kind
of threshing machinery you can
save money by writing to
The Aultman & Taylor Company
Mansfield, Ohio
for one of its large illustrated pamphlets
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"The Standard Thresher of the Vibrator Class"
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VICTOR THREE AND FIVE HOED ONE-HORSE WHEAT DRILLS.
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CENTENNIAL AND GRAND PARIS WORLDS FAIR PRIZES AND ALL THE U.S. STATE FAIR PREMIUMS IN 1877 & 1878.
PRICE, $350.
PUTS FROM 10 TO 12 TONS IN A CAR.
REQUIRES LESS HELP.
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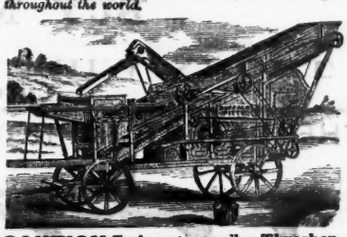
ORIGINAL AND ONLY GENUINE

BUFFALO PITTS

THE STANDARD of Threshing-Machine *excellence* throughout the *Grain-Growing World.*
SELDOM EQUALLED. *Never excelled.*
NOTORIOUS as a *fast yet thorough thresher, perfect cleaner,* and *entire saver of all* kinds and conditions of *grains* and *flax* and *timothy seeds.*
NOTORIOUS as the **only** machine that is a **success** in **all kinds of threshing** and a **failure in none.**
NOTORIOUS as the *best built, most durable,* and *handsomest* of the *Threshing-Machine Tribe.*
STEAM THRESHERS a *specialty.* Their superiority, it can be said with *truth,* is acknowledged *throughout the world.*



CAUTION To Agents as well as Thresher-men. Be sure you get the *genuine* **Buffalo Pitts,** made *only* at THE PITTS AGRICULTURAL WORKS, Buffalo, N. Y. It is said that other manufacturers are using the name "*Buffalo Pitts*" on their make of Threshing Machines.

This Unintentional Compliment to the *great reputation* of the *only* **genuine** *Buffalo Pitts,* by use of its title to sell inferior machines, is *flattering* to the **"Buffalo Pitts."** But Agents and Threshers must not be deceived, nor hold the **genuine** *Buffalo Pitts* responsible for the *faults of its bastard namesake.* For Catalogues and Price-Lists of the genuine Buffalo Pitts, address

THE PITTS AGRICULTURAL WORKS,
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Spiral Spring Singletrees. Secured by two patents. Price $3.50 per pair. Send for a pair, or send stamp for illustrated circular and full description. Local agents wanted. Territory for sale.

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MEDAL MACHINES.

New York State Agricultural Works.

First Premiums at all Competitive Trials.

Railway, Chain and Lever Horse Powers, Threshers and Cleaners, Threshers and Shakers, Clover Hullers, Feed Cutters, Wheel Horse Rakes, Corn Cultivators, Horse Pitchforks, Shingle Machines, Straw Preserving Rye Threshers, Portable Steam-Engines, Cider and Wine-Mills and Presses, Dog and Pony Powers, etc., etc.

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Send stamp for Circular and report of Centennial trial.

Received Medal AND HIGHEST AWARD OF MERIT AT CENTENNIAL.

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STEAM ENGINES,
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Cheapest and best for all purposes—simple, strong, and durable. Also Horse Powers and Gin Gear.

SAW, GRIST AND COB MILLS, GINS, PRESSES AND MACHINERY generally. Inquiries promptly answered.

Fig. 1.

Vertical Engines, with or without wheels, very convenient, economical and complete in every detail, best and cheapest Vertical in the world. Fig. 1 is engine in use. Fig. 2 ready for road.

Boilers 6 cyl. per larger than other makers.

Fig. 2.

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Penna. Agricultural Works, York, Pa.

Lightest draft, most durable, simplest, most economic l and perfect in use. Wastes no grain, cleans it ready for market.

Steam Engines, Horse Powers, Saw Mills, Engines & Boilers, Feed Mills, Shingle Mills, Cider Mills, Presses, &c. Catalogue Free.

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and all apparatus for Syrup or Sugar making. Circulars, with prices, &c., sent on application.

BLYMYER MANUFACTURING CO.,
CINCINNATI, O.
Manufacturers of Sugar Cane Machinery, Victor Cane Mill, Cook Sugar Evaporator, Steam Engines, etc.

THOUSANDS NOW in USE.

THE IRON TURBINE WIND ENGINE.

STRONG. DURABLE. Best in the WORLD.

BUCKEYE Force PUMP
NEVER FREEZES in WINTER.

MANUFACTURED BY
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SPRINGFIELD, O.
Send for Price List and Circulars.

HALLADAY STANDARD WIND MILL.

VICTORIOUS AT
Phila., 1876—Paris, 1878.
25 Years in Use.

GUARANTEED SUPERIOR
To any other Windmill Made.

17 Sizes—1 Man to 45 Horse Power.
Adopted by the leading R. R. Co.'s and by the U. S. Govt. at Forts and Garrisons.

$3,500,000 worth now in Use.
Send for Catalogue "A."
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We manufacture the old reliable **Stover**—the well tried, strong, durable, self-regulating, solid wheel **Wind Mill,** which took *the* Centennial Diploma, as well as a Medal. We refer to the **Official** Centennial Report. Also O. E. Winger's Improved $20.00 double Feed Grinder, which is operated by Pumping Wind Mills—a novel and perfect Mill for grinding all kinds of grain for stock and house use. Agents wanted everywhere. Send for catalogue **B.** Branch Factory at Kansas City, Mo.
E. B. WINGER,
Successor to STOVER WIND ENGINE CO.,
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Ne Plus Ultra

Automatic Windmill.

New, ten foot diameter of wheel, one horse-power, elegant and durable, made expressly for **raising water for Farm and House Uses.**
PRICE **$50.00.**
Any person can set them up.
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Gardner's Railway Pitching Apparatus.

Consisting of Carrier, Grappling Fork, Pulleys, and Hooks. For unloading Hay, Grain, Beans, Corn Stalks, loose or in bundles, etc. Can be used in any barn. Also, Improved Stacking Apparatus. Send for Circular, and get valuable information.
E. V. R. Gardner & Co.,
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Best in the Market for Home or Export Trade.
Eagle Horse or Hand Dump, Ithaca, and Centennial Steel Tooth Horse Rakes, acknowledged to be three of the best in the field. More than 100,000 in use, at home and abroad. Send for Circular.
WHEELER & MELICK CO., Makers,
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NICHOLS, SHEPARD & CO., Battle Creek, Mich.

Established in 1848. ORIGINAL AND ONLY GENUINE

"VIBRATOR"

Threshing Machinery and Portable and Traction Engines.

THE STANDARD of excellence *throughout the Grain-Raising World.*
MATCHLESS for Grain-Saving, Time-Saving, Perfect Cleaning, *Rapid and Thorough Work.*
INCOMPARABLE in *Quality* of Material, *Perfection* of Parts, *Thorough* Workmanship, *Elegant* Finish, and *Beauty* of Model.
MARVELOUS for *vastly superior* work in *all kinds* of Grain, and *universally* known as the *only* successful Thresher in Flax, Timothy, Clover, and all other Seeds.
ASTONISHINGLY DURABLE and *wonderfully simple,* using less than one half the usual gears and belts.
PORTABLE, TRACTION, and **STRAW-BURNING STEAM-ENGINES,** with special features of Power, Durability, Safety, Economy, and Beauty entirely unknown in other makes. Steam-Power Outfits and Steam-Power Separators a specialty. Four sizes of Separators, from 6 to 12 horse-power; also 2 styles Improved Mounted Horse-Powers.
39 Years of Prosperous and Continuous Business by this house, without change of name, location, or management, furnishes a strong guarantee for superior goods and honorable dealing.

CAUTION! The wonderful success and popularity of our VIBRATOR Machinery has driven other machines to the wall; hence various makers are now attempting to build and palm off inferior and mongrel imitations of our famous goods.

BE NOT DECEIVED
by such experimental and worthless machinery. If you buy at all, get the "ORIGINAL" and the "GENUINE" from us.
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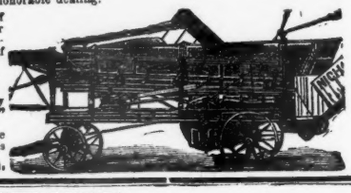

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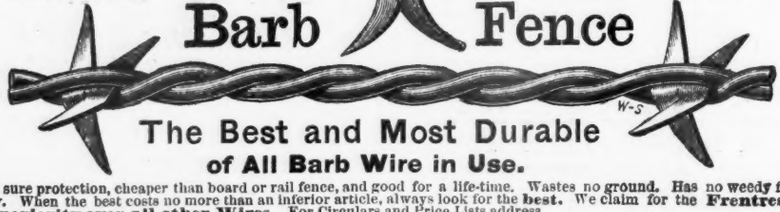
Patented Dec. 14, 1875. *Re-issued May 22, 1877.*

Steel Barb X Wire Fence



The Best and Most Durable
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A sure protection, cheaper than board or rail fence, and good for a life-time. Wastes no ground. Has no weedy fence row. When the best costs no more than an inferior article, always look for the **best.** We claim for the **Frentress a Superiority over all other Wires.** For Circulars and Price Lists address

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FRENTRESS BARB WIRE FENCE CO.,
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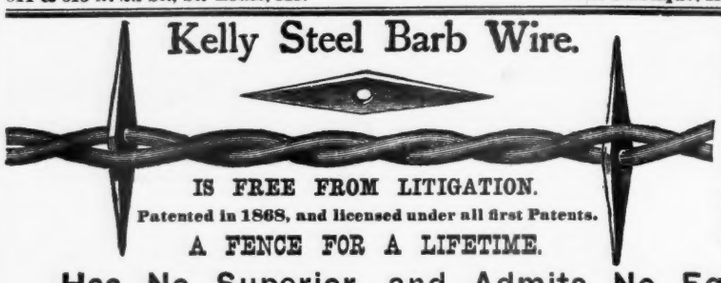
Kelly Steel Barb Wire.



Stock-Proof,
Storm-Proof,
Fire-Proof.
Weight only One Pound to the Rod.

IS FREE FROM LITIGATION.
Patented in 1868, and licensed under all first Patents.
A FENCE FOR A LIFETIME.

Has No Superior, and Admits No Equal.

The Kelly diamond-shape **Steel Barb** is placed on the wire without loss of metal, leaves no room for moisture to rust the wire, retains its sharp points, **and saves** fully **10 per cent in weight per rod.**

BUY NO OTHER.

If your Merchant don't keep it, send direct to Manufacturers. Send for Catalogue.

THORN WIRE HEDGE COMPANY,
CHICAGO, ILL.

THE LATEST IMPROVEMENT IN BARB FENCE.

The cut shows exact size of strand and distance apart of barbs. Not dangerous to horses or stock. Price the same by the pound or rod. **SAMPLES SENT FREE TO ANY ADDRESS.**
AMERICAN BARB FENCE CO., 60 Clark St., Chicago, Ills.

IMPROVED BAY STATE RAKE.

This Rake Received the Highest Award at the Centennial Exposition and Field Trial. The only Silver Medal awarded at the Paris Universal Exposition, in 1878.
This rake has taken more first premiums than any other rake.
It is Easily Handled by a Girl or Boy, strong enough to drive a horse.

An Illustrated Catalogue of all our Tools and Implements sent free.

THE BELCHER & TAYLOR
AGRICULTURAL TOOL CO.,
Chicopee Falls, Mass., U. S. A.

FARMERS AND DEALERS, READ THIS!

These cuts represent our **20** Steel-Tooth Horse-Rake, with Iron Hubs (or Locust Hubs boiled in oil)—**9000** in use—and our Positive Force-Feed Grain, Seed, and Fertilizing Drill (which can be changed to sow any quantity while Drill is in motion), with Pin or Spring Hoes—**8277** in use and giving satisfaction. All manufacturers say theirs are the best. All we ask is, send for *Descriptive Circular and Price-List,* which contains letters from persons using them. All are *warranted.*
Hagerstown Agricultural Implement Mfg. Co.,
State where you saw Advertisement. **Hagerstown, Md.**

COLUMBIA
BICYCLE.

Bicycle riding is unsurpassed as a method of travelling, whether for speed, sport, or the renewal of health. No horse can compare with the bicycle for endurance, no other pastime is half so fascinating, and the exercise is recommended by the medical profession as being most conducive to health. Appleyard rode 100 miles in 7 hours, over a common turnpike road, and Waller has accomplished 1,400 miles in 6 days. Send 3c. stamp for 24-page catalogue, containing price lists and full information, or 10c. for catalogue and copy of "The Bicycling World."

THE POPE M'F'G CO.,
No. 101 Summer St.,
Boston, Mass.

SEND FOR ILLUSTRATED PRICE LIST OF
PRESSES, DIES AND OTHER
FRUIT-CAN TOOLS.
FERRACUTE MACHINE WORKS,
Bridgeton, N. Jersey.

WELL BORING, ARTESIAN WELL DRILLING & MINERAL PROSPECTING MACHINERY.
and how to use, is fully illustrated, explained and highly recommended by the "American Agriculturist" in the November Number 1879. Page 465. Send for it. Portable, low priced, worked by man, horse or steam power. Needed by farmers in every county. Good business for Winter or Summer and very profitable. Can get good wells in earth or rock anywhere. We want the names of men that need wells. Send for illustrated price-list and terms to Agents. Address,
Pierce Well Excavator Co., 29 Rose Street, New York, U. S. A.

Grind your bone meal, crush your own oyster shells in the $4.00 Hand Mill. Samples 6 cts. Larger sizes for farmers—to run by power. Testimonials furnished.
FRANK WILSON, 52 Delaware St., Easton, Pa.

C. GILBERT'S
STARCH

Muth's All Metal Honey Extractor,
And Uncapping Knife.

Have received the Highest Encomiums!- Also Langstroth's Bee Hives; Honey Jars, and a full assortment of Bee-Keepers' Supplies. Every Bee-Keeper should send for my circular giving the details regarding the Care of Bees and How to get the most Honey. Sent free on application.
CHAS. F. MUTH, No. 976 Central Ave., Cincinnati, O.

☞ FRIENDS! If you are in any way interested in
BEES OR HONEY,
We will with pleasure send you a sample copy of our MONTHLY GLEANINGS IN BEE CULTURE, with a descriptive price-list of the latest improvements in Hives, Honey Extractors, Artificial Comb, Section Honey Boxes, all books and journals, and everything pertaining to Bee Culture. *Nothing Patented.* Simply send your address on a postal card, *written plainly*, to
A. I. ROOT, Medina, Ohio.

AGENTS WANTED EVERYWHERE to sell the best Family Knitting Machine ever invented. Will knit a pair of stockings, with HEEL and TOE complete, in 20 minutes. It will also knit a great variety of fancy work for which there is always a ready market. Send for circular and terms to THE TWOMBLY KNITTING MACHINE CO. 408 Washington St., Boston, Mass.

Are sold by all Hardware and Harness Dealers. There is no one owning a horse or mule but what will find in this line of goods, something of great value, and especially adapted to their wants. COVERT M'F'G CO., West Troy, N. Y., Sole Manufacturers.

Creameries on Trial.—The manufacturers of The Ferguson Bureau Creamery, announce that they will send out their Creameries on trial.

This apparatus has given such universal satisfaction for the last three years, and they have such confidence in its perfect adaptation to the wants of all dairymen, that they freely offer to send one to any reliable party, of such size as they need, on 30 days' trial. If it does not work satisfactorily it may be returned.

In the last year they have sent out over two hundred Creameries on these terms, and NOT ONE has been rejected.

Particular attention is called to the fact that the Creamery can be used with either ice, running spring water, or cold well water, and that it is especially useful in cold weather. After a person becomes accustomed to it, they will be able to use it nearly the whole year without artificial cooling, by taking advantage of the cool night air, according to the directions.

No other Creamery is offered on such liberal terms, and no dairyman in justice to himself, and to his wife (for they are especially adapted to dairies where women do the work), should buy any apparatus until he has given the Bureau Creamery a trial.

They also offer to send their Concussion Churn on the same terms.

Messrs. Wells, Richardson & Co., the well known manufacturers of the Perfected Butter Color, are largely interested in the Ferguson Manufacturing Company, and we have their guaranty that all the business of the Company will be done in the most honorable manner.

We advise all our readers in want of milk setting apparatus to correspond with the Ferguson Manf'g Co., Burlington, Vt.

TESTIMONIALS.

CORNWALL, VT., *May* 21, 1880.

THE FERGUSON MAN'F'G CO.—*Gentlemen:* You ask for my experience with the Bureau. We have used one for the last two years, and so far this.

We are perfectly satisfied with it, and are sure that it is the best method of setting milk, giving *all the cream*, and with the least labor in taking care of the milk. There are two in this vicinity, that are saving to those using them the expense of a hired girl—the ladies finding that the Bureau saves them so much work in skimming and washing small pans, that they can now do their own work alone easier than with help before.

We find that we do not have to use ice except in the very hottest weather; if we will take care to open the Bureau in the evening, so as to use the cool night air, and shut the Bureau in the mornig, it will keep cool all day.

One day this week, when the thermometer was among the eighties, the milk in the pan that I emptied at night was 62° by the thermometer, and that without any ice, showing how easily we can keep the milk cool by just using the night air. We have not put any ice in our Bureau yet this year.

To any one wishing the *Easiest, Neatest, Quickest* and most *Perfect* method of setting milk, we would recommend the Ferguson Bureau Creamery.

Respectfully, WM. H. MATTHEWS.

"I have used the Ferguson Bureau Creamery, and in my opinion it is the best cream-raising apparatus with which I am acquainted.

"I find it to produce the largest amount of Butter, and of the best quality, and with the greatest saving of labor. I prefer it to any deep-setting apparatus, or any open pans, and cheerfully recommend it to all dairymen."

May 22d, 1880. CHAS. E. FISKE, Greenfield, Mass.

[Mr. Fiske made the butter that took Five First Sweepstakes Prizes at the Mass. Butter Show last December, (the Mass. Sweepstakes, $50; the New Eng. Sweepstakes—a Mosely & Stoddard Creamer; the Ferguson Sweepstakes—a Bureau Creamery; the Franklin Co. do. —$12; the Boston dealers' do.—$10.]

AMERICUS CIDER MILL

WHITMAN'S PATENT.
The Best Cider and Wine Mill made. It will make Twenty per cent more Cider than any other.
Perfectly Adjustable.
Three Sizes.
Geared outside. Large Mills made for two cranks.
Prices as low as any first-class mills.
Circulars giving full description sent free
Address the manufacturers.
WHITMAN AGRICULTURAL COMPANY,
Saint Louis, Mo.

THE BAKER GUNS.

We make the best double gun in the world for the money—choke-bore, rebounding locks, extension rib. Our $40 gun has the best English twist barrels, and the best material throughout. All guns sent on trial and guaranteed.
Price—Best English Twist Barrels, $40. Damascus steel, $35 to $200. Send stamp for Descriptive Circular.

Three-Barrel GUN. Two Shot and One Rifle.

A new feature in the Gun line. It is light, compact; from 8 to 10 lbs. in weight. The Rifle is perfectly accurate. It has proved a great success for all kinds of shooting. All guns shipped on trial and guaranteed. Price $75 to $250.
L. C. SMITH, Sole Maker of Baker Guns, Syracuse, N. Y.

containing a great variety of Items, including many good Hints and Suggestions which we throw into smaller type and condensed form, for want of space elsewhere.

Continued from Page 260.

In justice to the majority of our subscribers, who have been readers for many years, articles and illustrations are seldom repeated, as those who desire information on a particular subject can cheaply obtain one or more of the back numbers containing what is wanted.

Back numbers of the "American Agriculturist," containing articles referred to in the "Basket" or elsewhere, can always be supplied and sent post-paid for 15 cts. each, or $1.50 per volume.

The German Edition.—All the principal articles and engravings that appear in the *American Agriculturist* are reproduced in the German Edition. Besides these, there is a special department, edited by an eminent German cultivator. Our friends can do us a good service by calling the attention of their German neighbors and friends to the fact that they can have the paper in their own language, and those who employ Germans will find this Journal a most useful and acceptable present.

Bound Copies of volume 38, and of every previous volume back to Vol. XVI. (1857), neatly bound, with gilt backs, Index, etc., are supplied at $2 each (or $2.30 if to be sent by mail). See Publishers' Notes, 2d cover page.

Clubs can at any time be increased by remitting for each addition, the price paid by the original members; or a small club may be made a larger one at reduced rates, thus: One having sent 6 subscribers and $7, may afterwards send 4 names more and $3, making 10 subscribers for $10.00; and so for the various other club rates.

Terms to New South Wales, New Zealand, Australia, Africa, etc.—To several inquirers. Under the latest revision of the Postal Union Regulations the price of the *American Agriculturist* (either English or German edition), including postage *prepaid* through, will be covered by 7 shillings sterling per annum. This applies to the above countries, and to all others embraced in the General Postal Union. The simplest mode of remittance is by Postal Money Orders, payable in London, to the order of Orange Judd Company. These can be readily cashed in N. Y. City at a slight discount, which the publishers will cheerfully pay. For Club rates, (postage included), see our second cover page, and reckon 22 cents to the shilling sterling.

Bitter Milk.—Last month we gave the statement of Mrs. "A. N.' of Texas, that the milk was made bitter by Dog-Fennel, which the cows ate. Prof. D. L. Phares, Woodville, Miss, writes that it is a common error to suppose that cows eat the plant named. He says: "Cows do not eat Dog Fennel, nor if eaten would it produce the alleged effect. The plant producing the bitter milk is *Helenium tenuifolium*—Bitter-weed. Where this plant is eaten in large quantities it causes the butter to be a little bitter and also the flesh. Mutton is rendered bitter by this same plant; and cooking does not remove the bitterness. Ignorance of these facts caused families to suppose that attempts were made by servants to poison them. And it has been my fortune more than once, by showing the true state of the case, to save innocent persons from prosecution for 'attempt to poison'." The plant in question is a native of the Southernmost States, and is sometimes seen in northern gardens. It has smaller yellow flowers than the common *Helenium autumnale*, the "Sneezewort" and very narrow, almost thread-like leaves.

Excursions to Europe.—When one has determined to make a visit to Europe for the first time, his first step in the way of preparation is to look up some friend who has already been there, and inquire of him as to routes, hotels, expenses, and such other particulars as will help him on the way. Every one can not readily find a person who can give him such aid, but he can procure it of Cook & Son, the excursionists, who have a wide reputation for taking excursion parties to nearly all parts of the world. It is not necessary to travel with a party in order to avail one's self of Cooks' facilities, as a large part of their business is in furnishing tickets and information to single travellers and families.

A Perpetual Source of Interest, and Instruction,

To every Family, and to every individual, is a really good **Compound Microscope,** which is a far more effective and satisfactory instrument than anything in the way of a Simple Microscope. The latter, by means of a single lens, or two or three of them placed together, simply magnifies objects from 3 to 25 diameters, though not very distinctly above 10 or 12 diameters. The Compound Microscope makes a magnified *image* of the thing looked at, while other lenses remagnify this image, and thus the original object is seen enlarged a hundred or a thousand or more diameters, and many thousand times its original size, according to the power of the instrument. Then it has sundry arrangements for adjusting the focus, for holding the object, for concentrating light upon it, etc., etc. The Microscope opens a new world to one far more extensive, and if possible more interesting than anything that can be seen with the unaided eye. For example, the fine dust on the wing of a butterfly, or moth, seen under the Compound Microscope, becomes a mass of most beautiful feather-scales of regular form and construction. The foot of a fly, or other insect, becomes an object of great interest. The mould upon cheese, or on leather, etc., appears as a minute forest of plants, as it really is. There is a vast number of objects all around us that can thus be exhibited to the eye in most wonderful forms, and the instrument is a perpetual source of interest, instruction, and wonder.

Until recently, a really valuable Compound Microscope, with all its parts, has been far too costly to be within reach of most families or individuals. After long effort, repeated trials, and many failures, the Editors of the *American Agriculturist* succeeded in securing a Compound Microscope having all the parts and the effectiveness of those costing five to ten times as much money, so that this most desirable instrument is now brought within reach of the great mass of the people. This most desirable end has been reached not only by new devices and inventions, but especially by the application of automatic machinery to making with great accuracy the multitude of parts that were previously only made by slow and less accurate hand-work.—A large number of these new Compound Microscopes have been made and tried, and strongly *approved* not only by the highest scientific authorities, but by many unscientific families who have put them to practical and most interesting use, so that we can now recommend it to all with entire confidence that it will give the highest satisfaction and delight, not only to the young and old of all classes, but to Schools, to Physicians, and to scientific investigators.

☞ A marked feature of this new Instrument is the **Camera Lucida,** which enables one to throw the greatly *magnified* image of any small object upon paper in such a way that it can be readily drawn or sketched for preservation, even by a child large enough to hold and use a pencil.

☞ A full Description of the Instrument, with engravings, showing its parts and use, etc., will be forwarded to any one desiring a copy, upon receipt of address.

How Much Corn for a Hen.—"G. B. T." Owego, N. Y. One bushel of corn will feed one hen for one year, and if she has the run of a barn yard and the fields, she will do well on this quantity. If given no other kind of feed, a hen will need a quarter of a pint of grain a day, or 45 quarts for the whole year.

Sit or Set?—"S." No, either is not right. You *set* a hen, but the hen's business is to *sit*. The hen *lays* eggs, and the eggs *lie* in the nest. There is a difference.

Moving Westward.—If we should draw a north and south line through the United States, dividing the country into two parts, so that there would be the same number of bushels of wheat produced on the west side of the line as on the east, it would be found that the line each year would have to be drawn farther westward. According to the report of the Bureau of Statistics, this westward movement of the dividing line has been on an average nearly 15¼ miles for each of the last 28 years, or upwards of 450 miles in the last 30 years. If an east and west dividing line is drawn it will be found to coincide nearly with the 40th parallel. The *central point* of wheat production is then moving to the west along this east and west line; it was in Eastern Ohio in 1849; ten years later in Indiana; a decade later in Eastern Illinois, and now the *hub*, so to speak, is in Western Illinois, but will soon cross the Mississippi.

To Destroy Chinch Bugs.—"T. H. G.," Whiteside Co., Ill. Chinch Bugs may be destroyed in great numbers, by burning the stubbles and rubbish, or by plowing it under, when many will find their way to the surface again. Burning makes an end of them.

"Seeding Down" With Roots.—"L. A. J.," Plymouth Co., Mass. This is always summer or fall seeding, and is done after the cultivation of the roots is over. The practice is most usual in connection with such roots as may be harvested without much disturbance of the ground; but it is not particularly objectionable to seed down with Carrots, Sugar-beets, or such Mangels as have to be started with a spade, or fork, at harvesting. It is important that the ground should be left nearly level at the last hoeing, to rake or hoe in the seed, and to roll after the roots are pulled.

Ash of the Pea-Nut.—H. B. Cornwall, Prof. of Analytical Chemistry in the John C. Green School of Science, College of New Jersey, Princeton, having occasion to refer to the composition of the Pea-Nut, could find no analysis of the ash. This deficiency was supplied by Mr. W. M. Norris, a post graduate student at the School; the results of the analysis, now for the first time published, are forwarded by Prof. C.

Per 100 parts of Ash;

Silica	1.05	Magnesia	12.65
Potash	44.73	Phosphoric Acid	17.64
Soda	14.60	Sulphuric Acid	2.53
Lime	1.71	Chlorine	0.15

Carbonic Acid and Carbon undetermined.

The kernels yielded 2.08 per cent of ash.

Spent Tan Bark.—"W. A.," McVeytown, Pa. Tan bark is of no use as a fertilizer, except for the ash it contains. The best use to make of it is to employ it as a mulch around young trees, currant bushes, etc.

To Break Up a Broody Hen.—"J. S.," Baltimore, Md., gives his method thus: "You inclose the hen in a coop (light or dark), and keep her there for 3 days and 3 nights. She must not have a particle of victuals or drink. When she emerges she will be so 'run mad' hungry, as to banish all thoughts of her former intentions. No fear of starvation in this plan. I have practised it for years, and recommended it to hundreds. It is a sovereign cure. Several hens may be put together. One obstinate case in 100 *may* occur. Then repeat the dose."—But how about the Society for the Prevention of Cruelty to Animals, and its good work?

The Boys' Cotton Crop.—The "Alabama Farm Journal" has offered a premium of $50 to the Alabama boy who shall raise the largest crop of cotton on a half-acre of land. We hope there will be a large number of young cotton growers that will enter their names for this prize; of course only one out of the hundreds who try can get the prize, but the trying will do every one much good. Other States might offer prizes for different crops.

Some Dairy Figures.—The dairy industry in the United States represents over $1,300,000,000, with an annual production of $350,000,000 worth of Butter and Cheese. This is $50,000,000 more than the wheat crop of the country. The number of pounds of butter made last year, as near as can be calculated, was 1,500,000,000 pounds.

Fish Skins.—It is comparatively recent that fish skins have been put to any practical uses. At Gloucester shoes have been made from the skin of the Cusk, and a patent is said to have been secured for this preparation. The skins of thornbacks are prepared as a substitute for sandpaper. Bouquets of flowers are also made from them.

The English Sewage Farms.—"M. W. S.," LaSalle Co., Ill. The sewage farms in England have not been profitable ventures directly. Indirectly they have saved money for the towns and cities, inasmuch as the cost of running the farms has been less than that of disposing of the sewage in the ordinary way, considering cost in its fullest sense and not in its pecuniary meaning wholly. Every dollar's worth of product grown on the farms has cost probably two dollars, but the waste has been got rid of very cheaply and inoffensively. Reports of the different sewage farms have been published in various English journals, but we do not remember that there has been any publication in a more permanent form.

T. N. S. S. F. T. P. O. C. A.—What a pity that so good a thing should have such a name that its initials only, make the formidable array of letters above given. "The Nova Scotia Society for the Prevention of Cruelty to Animals" sends us a circular by its Secretary, John Naylor, Esq., in which they announce to kindred Societies, and to all interested, that they have examined a new cattle car, which they recommend to other Societies and to railroads generally. To read the description of the excellent arrangements for the comfort of the animals, one wishes that the inventor would turn his attention to the construction of cars for carrying passengers.

A Doctor on Pie.—Here is a man, and a doctor too, that has no sympathy for the much abused pie. "Pie is vile, because it is indigestible, inexcusable, and mysterious. It is indigestible from the very nature of its composition, it is inexcusable because it is tampering with the holiest functions of the stomach to offer pie to it in place of food, and it is mysterious because you don't know what you are eating."—There are two general classes of pie, the one we eat and think well of it, the other—well! it is the kind the doctor has described.

Cabbage Worms Again—Other Remedies.

The Cabbage Caterpillar or "Worm," has so many natural enemies, that these, aided by the means for its destruction employed by the owner of the cabbages—man—have so greatly reduced its numbers that we now hear but little of it in localities where, a few years ago, it was feared that cabbage culture must be abandoned. In those places where it appears for the first time, cultivators are having the same experience that those of us had who endured the visitation when the insect first appeared in this country a dozen or so years ago. It happens that the Cabbage Worm is a matter of great importance in some parts of the country every year, and whatever relates to its destruction is of interest to a large number of readers. We gave, last month, some hints about destroying the worms in advance, so to speak, by killing the moths before they can lay their eggs. We also stated there, that the most generally successful remedy is hot water. To many, the idea of applying hot water to a living plant is new, and such persons ask for more full directions. Like the hunter who aimed to kill if the animal should be a deer, but to miss if it were a calf, we must have the water hot enough to kill the worm and miss the plant. This is 160°, or from that to 170°. One with a little practice, after learning how water heated between 160° and 170° feels to the hand, hits the right temperature without the use of the thermometer every time. The water is conveniently applied with a common watering-pot, but that is ordinarily made with a rose, which scatters too much, and there is a waste of water, a matter of no little consequence if one has to bring it a long distance. If many plants are to be treated, it will pay to have a rose made for the purpose, one much smaller than those sold with the pot. It should be, borne in mind that the water, in passing through the air in small streams, will cool rapidly. Matters should be so managed that the water shall be at the temperature named when it reaches the worm. The water in the pot may be considerably hotter than 170°, and if need be, cooled by holding the rose at some distance above the plant. On the other hand, if the water is scarcely above 170°, the rose, in applying it, should be held close to the plant, to avoid cooling. Those who put a little thought into their work will have no difficulty.

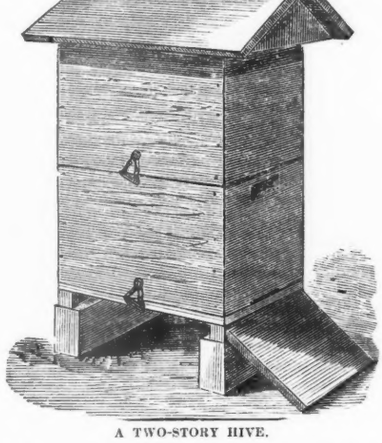
A correspondent, "G. M. L.," Cincinnati, O., writes that Wheat Bran, or Shorts, if sprinkled upon the cabbages when they are wet with dew, or rain, will completely banish the pests. When the Cabbage Caterpillar first made its appearance we gave all the remedies in use in Europe, where it is an old trouble, and Bran among the others. Since then, having heard nothing of its use, we had forgotton about it until reminded by our correspondent. We suppose the bran, in this case, acts mechanically rather than as a poison; the particles of bran probably irritate or otherwise annoy the worm and interfere with its movements, and the insect starts off in search of more comfortable feeding grounds.

Among other things used in Europe to get rid of these caterpillars is the common Brake, or Bracken, a tall coarse fern (*Pteris aquilina*), found almost everywhere. The fronds (leaves) of this are laid upon the cabbages, and the worms are said to leave at once. The leaves of the Elder are used for the same purpose; our Elder is quite different from the European, and may not have the same effect, but it is easily tried. In France the refuse from the Hemp brakes, the broken leaves and crushed seed pods, is used. The odor of this is said to kill the worm in a very short time. It has been suggested to sow Hemp seeds between the cabbage rows that its odor may keep off the insect. A year or two ago we published the statement that some European gardener had discovered that water, in which the clippings of Tomato-plants had been steeped, promptly killed plant-lice and other insects. We would suggest a trial of this upon the Cabbage Worm. While we have no doubt of the efficacy of hot water, a cold application is attended with much less trouble, and for that reason preferable.

Bee Notes for July.

BY L. C. ROOT.

It is safe to say that the greater part of the best surplus honey is, in most northern localities, gathered from Basswood. The bloom commences in Central New York from the 10th to the 20th of this month; the present season it may begin even earlier than this. The yield continues from 12 to 20 days, according to the variation in the opening of the flowers, caused by the difference in altitude and other local causes. Basswood is a free bloomer, and generally yields honey profusely, and of superior quality; in fact, I think basswood honey is not surpassed by that of any other plant in any region of the United States. I speak of this to show the necessity of having all things in readiness, to take the advantage of this most valuable honey yield when it comes. The practical bee-keeper has been preparing for this harvest for many weeks. Strong stocks, and plenty of room for storing surplus honey are the essentials. Every bee-keeper should be familiar with the sources from which he is to expect his honey, and be fully prepared to secure it promptly. If a day is lost, no after vigilance will secure the honey which might have been obtained during



A TWO-STORY HIVE.

that day. Many bee-keepers wait until the yield has begun, before they prepare their boxes, or arrange their swarms for surplus, and they are the ones who find the keeping of bees the least profitable. The basswood blossom matures very slowly. In riding through the country for the past week, I have looked for the first appearance of the buds, I find the trees heavily budded, at this date, May 29th. They are nearly one half the size they will attain when open, and yet they will not be in bloom until the first half of July. The old saying that "good things come slowly" is applicable here. They seem to start thus early, and mature slowly, to keep us in mind of the good yield coming, and to give us ample time to be fully ready. Let us then have our boxes ready with generous starters of natural comb, or comb foundation, and properly arranged at as early a date as the bees will begin filling them—or if the surplus is to be taken in the form of extracted honey, have the empty combs in place which are to be used for this purpose. There are two methods of doing this: many bee-keepers prefer placing one hive above the other; as shown in the engraving. Others advocate a brood hive where the extra combs are added at the side of the brood combs. Our preference has been to place these combs at the sides rather than the top. We shall test the two methods extensively the present season, and give the results at a future time. If it is the intention to extract the honey, procure an Extractor in season, and have casks or cans in readiness for storing the product. I speak of basswood at this time because of its value in most locations. The same advice is applicable to any class of blossoms from which the yield of honey may be expected. Be ready for the yield from whatever source it may come.

Ice and Ice-Houses.—In these hot July days, we would call the attention of those who did not build and fill an ice-house, as advised last winter, to the comfort, convenience, and money value of a good supply of ice at this season of the year. Perhaps this reminder will stir some persons up to the resolution to build and fill a house the coming winter, at least it is hoped so.

American Apples Abroad.—The extent to which our apples find a market in Europe is surprising. It is impossible to give any exact figures on this article of export, but when a single firm shipped 30,000 barrels in 1879—a poor apple year—we may conclude that our standard fruit is in demand; and that the best varieties—those of fine quality, and good keepers—will find a ready foreign sale. It is reasonable to expect that the close of the present year will see the export of apples well up among the millions of barrels. With this expectation, it is well for orchardists to see that a good share of their fruit is of a kind that will bear the ocean transit, and also be acceptable to the eye and palate of the foreign consumer. The Baldwin, Newtown Pippin, Spitzenberg, Northern Spy, and Roxbury Russet are among the foremost of the varieties that are in most demand abroad.

Small Fruits.—This is the season of small fruits, and we wish every family throughout the country had all of them that they could use. A noted writer has recently said: "Small Fruits, to people who live in the country, are like heaven—objects of universal desire, and very general neglect." There is more solid truth than comfort in the above remark that is so strongly put.

Drawing Grain, etc.—If there is only one team upon the farm, and two wagons are to be had, it is often a great saving of time to change the team from one wagon to the other, so that there may be a wagon in the field loading and another in the barn being unloaded at the same time. In this way there may be no going of the hands to and from the field, except the one who handles the team. Three wagons and two teams are still better.

Fix Up the Barn.—When we go along the country highway, and see the wide cracks in the empty barns, we want to stop and tell the owner that those cracks are leak holes in his farm management. Through these places the farmer's profits slip away, because the thief—cold—finds here its entrance. While his cattle shiver, some fodder must pay the cost, or less flesh and milk are the results. Now, before another winter, stop the leaks.

Results of Ensilage.—Dr. John M. Bailey, of "Winning Farm," near Bellerica, Mass., is pleased with his results of Ensilage. He says; "Since the opening of my silos, Dec. 2, 1879, I have been feeding a large stock of cattle and sheep upon corn fodder, ensilaged last Sept. I am now (May 1), feeding my milch cows, and ewes and lambs upon it exclusively. Its preservation is as perfect as when the silos was first opened." Dr. Bailey cordially invites farmers to visit his silo, and inspect the system of preserving green fodder, which he prizes so highly.

Cow Milkers.—There are still inquiries regarding "milking machines" now and then coming to us, and this of itself shows that many are at least slow to accept them as proper instruments in the dairy. There are cases when tubes of some sort are necessary to draw the milk from the udder, as, for example, when the teats are badly chapped, the udder caked, or when the cow is a very hard milker. Under ordinary circumstances the old way is the safest and best, and if nothing is the matter with the cow we should not encourage the use of any of the milking tubes or so-called "milking machines."

The Buckwheat Field usually receives the poorest attention of any farm crop, and sometimes the preparation given the soil—usually the least fertile portion of the farm—is so imperfect, that it seems like imposing on the good nature of this plant to sow it and expect it to grow at all. But the buckwheat plant can stand this harsh treatment better than any other grain, and for this reason it is so valuable in building up a worn-out, or otherwise poor soil. It should be borne in mind that if buckwheat will improve a field when poorly treated, it will do all the more good if the soil is thoroughly prepared for it, that a good bed may be given the seed to grow and do its best. If it is intended to plow under the crop as a green manure, then an application of a quick acting fertilizer will pay well, that a large growth may be secured to be turned under.

Coal Ashes for Walks.—Coal ashes are of very little value as a fertilizer, and are not worth applying to the soil unless they will make it lighter and loose, and thus improve it mechanically. After trying all sorts of materials, a writer in "The Garden" (London) says he finds none better for walks than coal ashes. The bottom of the walk is made of stones and coarse pebbles, covered with an even surface of the ashes, which, when thoroughly rolled down, makes one of the most pleasant of walks, and is easily kept free from weeds, and smooth and compact. This agrees with our own experience.

The Auction Sale of Jerseys.

The public sale of Jersey cattle in charge of Peter C. Kellogg & Co., held in New York City on May 26-27, was in some respects an interesting and noted one. It afforded a striking illustration of the importance which is now attached to animals that have a blood relationship with those that are or have been great performers at the pail. The reputation which the cow "Alphea" obtained as a butter producer, attaches itself to all animals that have the blood of that famous cow or that of her own brother, "Jupiter," in their veins. A portrait of "Alphea" was given in the *American Agriculturist* in May last, where will be found an account of her great butter-making qualities. We did not at that time think we should so soon have an illustration of the great value that attaches to such an animal in her progeny. The descendants of "Alphea" and "Jupiter" will sustain the reputation of the mother of the "'Alphea' strain" of Jersey cattle, and it is because these qualities are perpetuated, that so much importance is attached to the nearness of a given cow to another that has been a remarkable milker. For example—"Eurotas," the most famous Jersey cow now living, is a granddaughter of "Alphea," and there are others that are, so to speak, "chips from the same block." It is not surprising that those animals at the sale, which had more or less of this valuable "Alphea" strain, were eagerly sought for, and the prices at which they sold were high. A son of "Eurotas" headed the list—a calf "Ramapo" of 7 months—and was struck off to Mr. Lawson Valentine, of New York, for $600. This was a surprisingly low figure, and an offer of $1,000 was shortly refused by the purchaser. This handsome animal is now at Houghton Farm, Orange Co., N. Y., where it is expected he will develope into a breeding animal that will sustain the reputation of his family and worthy of the distinguished company in which he will find himself in the Houghton Farm herd. The two cows having the largest proportion of "Alphea" blood, namely, "Myra 2d" and "Lass Edith," were highly appreciated by a number of cattle men, and the bidding was spirited and enthusiastic. Both were purchased by Mr. Valentine at the following figures: "Myra 2d" (6289), at $1,400; "Lass Edith" (6290), at $1,425. The mingling of the "Alphea" blood in these valuable cows, and also the relationship which they bear to each other, can best be shown by the combined pedigree chart which is here given. It is interesting to note that the two heifer calves of these cows sold at the same sale at the following figures: "Lass Edith 2d," $825, to Moulton Bros., and "Donnabel," daughter of "Myra 2d," sold for $810, to J. Stillman. "Butter Boy," the sire of these valuable young heifers, was also secured by Mr. Valentine. It is a matter of congratulation that the animals of the "Alphea" strain were not widely scattered in the public sale, but were kept together as the foundation of a Jersey herd at Houghton Farm, which, under the supervision of Prof. Manly Miles, Mr. Valentine can reasonably hope to make of national reputation. The sale of the second day consisted largely of unregistered and grade animals, and was in marked contrast with that of the previous day, in the character of the animals and the prices at which they were sold, and the two days afford a striking illustration

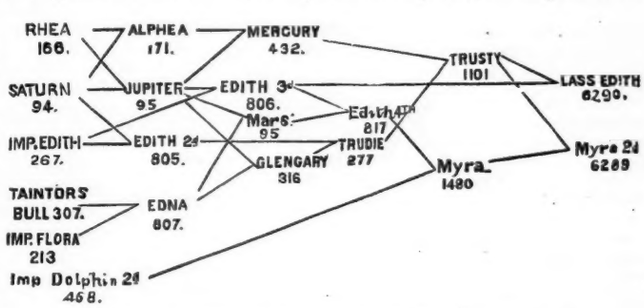


DIAGRAM OF PEDIGREES OF "LASS EDITH" AND "MYRA 2D."

of the real money value of a noted pedigree. If some of our readers consider the prices paid for the cows and heifers as "fancy," and extravagantly high, we have only to say that the animals sold for what a company of shrewd and intelligent breeders considered them worth, and they were the result of sharp competition among men who are not given to paying more for things than they are really worth. The prices would indeed be "fancy" as the value of these as butter-making cows and heifers, but with them was bought the possibility of a long line of descendants, each of which can claim a share of "Alphea" blood. How valuable this blood is, the sale of the second day shows. Here good animals were offered, but they could not only not trace back to a strain of "Alphea" blood, but could not trace back at all, having no record. As a consequence, sixty-two cows, some of them excellent milkers, sold at an average of about $50 per head.

Winter Fodder—Still a Chance.—The grass in many places has been destroyed by the Army Worm, in many other cases a short hay crop is due to the drouth. But farmers can still sow fodder corn with a fair prospect of a good crop. This can be cured in the usual way, or stored fresh in *silos*. Though we have already given a full account of the process of *ensilage*, we shall describe it again in time for those who wish to do so, to make a trial of it. It is sufficient to say in this last word, as we close the pages, that there is no real cause for any one to despond. The great national plant, Indian Corn, now comes to the rescue. Early and prompt action—an abundance of manure, if green and fresh, no matter, a quick growing kind of corn, and sowing at once, will, in all ordinary seasons, give an abundant crop, of the best possible fodder. Do not lose a day, but sow the corn.

Canoe and Camera.—A Two Hundred Mile Tour through the Maine Forests, by Thomas Sedgwick Steele. New York: Orange Judd Company. This work will be appreciated by two classes of persons: those who go to the Maine forests, and those who do not. It is not many years since the "back woods of Maine" were quite unknown to any save lumbermen, but of late, as their attractions became known, they have been penetrated by tourists, each year bringing increased numbers. To those who contemplate a visit to this little explored country, this work will be most valuable, as it has all the accuracy and much of the minuteness of a guide book, without any of its dullness. The addition of a map, on a large scale, prepared especially for the work, adds greatly to the value of the book, and make it indispensable to all who visit that region. Those who do not go to the Maine forests—that large class of stay-at-home travellers—will find this work the next best thing to a tour, as it presents the peculiar features of the country, the incidents of travel and camp life, in a fresh and pleasing style, while the descriptions are supplemented by a profusion of engravings largely the result of having a "Camera" with the "Canoe," though they are by no means all from photographs. Sketches by the author himself, and several artist-friends, give a pleasing variety, in which the humorous and sometimes ludicrous aspects of canoeing and camping are not overlooked. The general excellence of the engravings deserves mention, and some of them might be taken as examples of the present perfection to which the engraver's art has reached in this country. The paper, press work, and binding, all combine to give the work a fitting setting, and make it one of the most beautiful volumes yet added to the tourist's library. Price, $1.50.

The American Bicycler.—This work, which was noticed a few months ago, now comes to us enlarged by an "Appendix for 1880," which adds 60 pages of new matter of interest to all who run on wheels.

Sending Fruit.—Some send us specimens that we may see how fine they are, and others send them to be named. Some think to pay the express charges, others do not. If it were only now and then we were required to pay express charges, it would be of little consequence, but when this occurs several times a day, it amounts to a larger tax than we care to pay. Our friends should bear this in mind when sending fruit.

Special Cultures—Tobacco and Onions.—Within a few days we have had letters asking about the cultivation of Tobacco and Onions, to answer which in full would require us to write several treatises. It was to meet just such inquiries as these that we several years ago offered prizes for the best essays on their cultivation. Several essays besides those taking the prizes are printed, and each little book contains fuller information on the crops than can be found elsewhere. The same may be said of Hops and Flax.

Wild Hops.—"Mrs. E. J. V.," Howard Co., Neb., sends a specimen of Hops found growing in the State, asks if it is of a good kind for cultivation, and how to grow them from seed. The chief difference in the few varieties of hops is in the size of the clusters, and those sent are of very good size, the largest we have seen from wild vines. Hops are not multiplied from seed. It is a plant with separated flowers, some bearing all staminate or sterile flowers, and others all pistillate or fertile ones. When seeds are sown, a large share of the plants may be sterile, and this can not be ascertained until the second year at least. They are propagated by sets, or shoots taken from the old plants in early spring. Shoots 4 to 6 inches long are used. In cultivated plants, each hill, or old root, pushes a great many more shoots than are needed, and the excess are taken for new plantations.

The "American Wonder" Pea.—Last year we had a very short row of this variety in a favorable season; this year we had a row over 200 feet long, in a most unfavorable season. Taking the two together we have formed a most favorable opinion of the "American Wonder" which is based upon these facts—1st, It is dwarf; 2d, it is early; 3d, it is productive; 4th, it is of most excellent quality. While our experience does not allow us to make a positive assertion, we have no doubt that it will be found to yield more from the same area than any other early pea, because it can be planted so much closer than the sorts that require brush. It grows only about a foot high, and each plant is well loaded with, in favorable seasons, long, well filled pods. With us these have matured all together, allowing the crop to be taken at one picking, an excellent feature in a market pea, and while not considered so desirable in the family garden, it will not be found an objection when provided against by successive sowings. For quality on the table it is easily first class. Messrs. B. K. Bliss & Sons deserve the congratulations of the whole gardening community for having introduced so excellent a variety of this popular vegetable.

Shirts by Mail.—The Newark Shirt Company, Newark, N. J., at one time advertised to send shirts by mail. Though they have not advertised for a long time orders continue to come to them, and we would relieve them of the trouble of returning them by saying that they have discontinued their retail and mailing departments, and confine themselves to manufacturing for the trade.

Keep the Head Cool.—There is reason in the notion that a cabbage-leaf worn on the head, within the hat, will prevent sun-stroke. There is no special virtue in cabbage-leaves, any other leaves will answer—so will wet paper. Any thing of the kind worn upon the head will serve to protect it from the hot sun.

Strawberry Jam.—A correspondent wishing us to name a variety of strawberry, placed the fruit in a box, with alternate layers of cotton batting, the box being but partly full. When they reached us, there was too much cotton among the strawberries, and too much strawberry among the cotton, for either to be especially useful. Strawberries need no packing material, beyond what their hulls, which should always be left on, afford, and the box should be so full, that they can not shake.

The White Grub and June Bug.—Last month, p. 247, we mentioned the success of W. C. Stiles, Jr., of W. Va. in catching June Bugs, by the use of a lantern set in a pan of water upon which was a layer of coal oil. Mr. S. writes that he finds the trap to answer as well without the oil as with, and that no beetles appear until two hours after sunset, hence the expense of keeping up the lights before that time may be saved. He says that he has caught with two traps in seven nights over 1,500 June Bugs! This is a very important matter. If this meant only the destruction of the same number of white grubs, it would be worth all the trouble; but allowing the beetles to be half males, which is hardly probable, and the female to lay the small number of 100 eggs, this would make 75,000 white grubs which are—not killed off, but prevented from existing at all.

Hats for Horses.—In the hot days of summer, one rarely meets a dray horse or other hard-worked horse, without some contrivance for preventing the direct rays of the sun from beating directly upon its head. Some styles of these hats were given last Aug., on page 314, and there are a vast number of other methods by which the same end—the comfort of the horse—and it may be its safety, for horses have been known to be overcome by heat, and suffer greatly on its account.

The Army Worm and Grape Vines.—Just as these pages are being closed, the report comes that in the vine-growing portions of Burlington and Ocean Cos., N. J., the Army Worm is devastating the vineyards. The vine has not before been considered liable to the attacks of this voracious eater, which seems to develop new likings in its present visit.

"Rural Improvement, by B. G. Northrop, Sect'y of the Conn. State Board of Education," is the title of a pamphlet of about 50 pages, sent us by the author. In February, 1878, we gave an account of the good work done by the "Village Improvement Association" at Litchfield, Conn. In various other villages and towns in Conn. are other Associations actively engaged in improving the surroundings of the homes of its members, and consequently increasing the beauty and attractiveness of the whole town. The existence of these Societies, and the results they have produced, are largely due to the efforts of Mr. Northrop. His official duties taking him to all parts of the State, he has been able to see where such improvements were needed; having a happy way of presenting the subject, and a talent for organizing, he had only to call the people together, point out what should be done, and an "Improvement Association" was formed forthwith. The present treatise is a plea for such Associations, pointing out the good work they can do, not only in increasing the attractiveness of a place, but its healthfulness. It also presents the economic value of tree-planting, and gives useful hints to Railroad Corporations and manufacturers as to embellishing the grounds around their stations and factories. A form of Constitution for a Village Improvement Association is given. The work is quite as much needed elsewhere as in Connecticut; indeed, there is not a village in the land but might be increased in beauty, and consequently in value, by following the hints here given. Sent post-paid for 25 cents.

Beet Root Sugar, and Cultivation of the Beet, by E. B. Grant. Boston: Lee & Shepard. This work bears upon its title page 1880—and there is nothing in its preface to show that it is not a new work. One need not read far to learn that he has in hand an old work, which, however valuable in itself, is far behind the present condition of the beet-sugar interest. The book originally appeared in 1866, and does not seem to be modified in any respect in this reprint. The work contains much that is useful, and has long formed a part of the standard literature of the subject. Price, $1.25.

The Mississippi Valley Hort. Society.—Our usual Fair List will show that this Society's exhibition will be held at St. Louis, Mo., Sept. 7th, 8th and 9th—but something more than this brief announcement is required in this case, as it is the first exhibition of an Association that is apparently to become one of the most important among our many Horticultural Societies. Delegates from the horticultural societies of the different States forming the Mississippi Valley, from that of Texas on the south to that of Iowa on the north, met some time last spring and effected a preliminary organization and appointed an Executive Committee to arrange for a meeting and exhibition in September. Parker Earle, President Ill. Hort. Soc. is Chairman of this Committee, and S. M. Tracy, Sec. Mo. Hort. Soc., is Secretary; his address is 600 Olive street, St. Louis. Covering so many degrees of latitude by its territory, the coming exhibition should be a most varied and interesting one. It is to be held at the hall of the St. Louis Merchants Exchange, which is said to be "the largest and finest in America." The Exchange moreover guarantees the sum of $2,500, which allows of liberal premiums, a schedule of which is before us. For the best collections of each of the different fruits $100 is offered for apples and $50 each for pears, peaches, and grapes. With a Society like this, it becomes a question whether it is desirable to offer money premiums at all. While it may be well to do this at its first exhibition, we think it will be wise to have medals and certificates instead of money—as this will relieve the Society from an element of weakness that always attaches to those societies, the treasuries of which depend upon the annual dues of members. While this Society is intended especially to promote the interests of the horticulturists of the Mississippi Valley, the co-operation is invited of "all interested in the horticultural growth of the country, without regard to locality." We give this new Association our best wishes for its success, and hope that many a one outside of the "Valley" may find it convenient to be present next September.

Practical Camellia Culture, by Robert J. Halliday, Baltimore, Md. Mr. Halliday has long been known as a Camellia grower of large experience, and the results of that experience are here embodied in a work of about 140 pages. It is one of those satisfactory horticultural works, that seem to be peculiar to this country. It tells all that there is to be told, in a plain, straight forward way, beginning at the beginning, and treating every part in full. It is a matter of regret that in so useful a work, the engravings are not in keeping with the text—still they are intelligible, and that is the main point in a practical work.

Practical Artificial Incubation, by J. F. Ferris, Editor of Poultry Monthly, Albany, the Ferris Publishing Company. But few are aware of the widespread interest in artificial incubation that his correspondence makes known to an editor. The matter appears to have attained to too great success, to be disregarded, and it is not yet sufficiently successful to be generally adopted. Whoever will make the last step, and give us an incubator that will produce chicks with as much certainty as the old hen, will be a public benefactor. In this work, Mr. Ferris shows what has been done in the artificial hatching and caring for chicks, and presents various incubators with the claims made for them, by their inventors. This work allows those who are investigating the subject, to have the materials together in a compact form for ready comparison. Price, post-paid, 50 cents.

Potato Bug Enemy.—"W. A.," Lebanon, N. Y., sends Potato Beetles, covered with a minute parasitic insect. It is by no means new, and we wish it were more common. You are right in supposing it to be an enemy to the Beetle. It is a mite, first described by Prof. Riley as *Uropoda Americana*, and figured by him in his work on "Potato Pests." The same was reproduced in the *American Agriculturist* for July 1878, page 267.

Never Keep an Old Sheep.—"It is a piece of folly to keep old sheep;" says a great sheep grower, and that with good reason. The end of every sheep is the shambles; it may give one or more fleeces of wool on the way, but not so many that the carcass will cost more to fatten than it will bring. A ewe should not bear lambs more than five times; at the end of this period the carcass will, with proper care, be round and full, and can be fattened with comparative ease. Should the animal be a pure blood and of a family or strain of blood that is scarce, the case will be otherwise, for the carcass is then considered of very little value as compared with that of the offspring that may be obtained.

Value of a "Calf Feeder."—It is settled beyond a doubt that allowing a calf to suck is an injury to the cow, while at the same time it is the best method of feeding the calf. But as the cow is above the calf in value and importance, it is economy to remove the offspring and that so soon as the milk is fit to use—after the third day. The objection to the system of allowing calves to drink from a pail, namely: that no saliva of any account is mingled with the fast swallowed milk is overcome by the "Calf-Feeder," which is now used to some extent and highly prized by those who know its value. The "Feeder" is a covered pail arranged with a rubber teat on the cover and connected with a tube, the open end of which is in the bottom of the pail. The calf is soon taught to use the feeder and by the process of suction—quite natural to the calf—the saliva flows rapidly and is mixed with the milk; and the calf is better satisfied as is also the owner when the young animal is turned over to the butcher or is kept for a longer period.

Wooden Shoes.—The newly arrived German immigrant often appears in the shoes to which he was accustomed at home. These are large *sabots*, or wooden dug-outs, and are clumsy in appearance as well as noisy upon the floor or pavement. They have one thing to commend them, each one can make his own without the aid of the shoemaker. However unsightly they may be, these shoes are really serviceable; wood being a poor conductor, they keep the feet warm, and being impervious to water, keep them dry. Indeed there is so much in favor of the use of wood for the soles, at least, of shoes, that several American manufacturers have adopted it for certain styles. A firm in Pennsylvania several years ago made wood-soled shoes, and we for some years kept a pair of these to slip on when going into the garden or field in damp, cold weather, and found them very useful. There are many whose occupations require shoes that shall be both durable and comfortable; this is especially the case with farmers, who are exposed to all sorts of weather, and we are glad to learn from our advertising columns that shoes with wooden soles are still made by Chas. W. Copeland, of Boston, and more than that, are well made. Were they to come into general use among farmers, we do not doubt that many a fit of illness would be prevented by those who would wear them.

Sorghum Machinery.—Sometimes a catalogue is more than a mere list of articles and their prices, and gives besides matters of interest relating to the uses of the materials offered. The catalogue of the Blymyer Manufacturing Company is of this kind, and besides offering Sorghum machinery, it tells a good deal about Sorghum. This firm were among the first to meet the wants of farmers by providing them with Sorghum machinery at the time when this crop was first introduced, and they have since kept pace with all the improvements in this important branch of agriculture. It is a matter of regret that in an article on Sorghum in March last, all reference to this firm was inadvertently omitted—and it is only an act of justice to say, that whatever position sorghum culture may occupy in the future, will be largely due to the labors of this Company in the past. Their catalogue shows that they are prepared to meet all the new demands created by the improved variety of Sorghum with the machinery for working it up into the best products and that in the quickest and best manner.

The Potato Disease in Europe.—The heavy losses which the farmers of Great Britain have experienced during the last five years from the Potato Rot, have given rise to serious doubts whether this valuable crop can be grown with profit in those countries in the future. Like every other agricultural trouble, this one stimulates thought, and leads to new methods of culture, that are experimental, and it may be beneficial. Of late much attention has been directed towards the finding of a "disease-proof" variety of potato, or at least the production of sorts, that though attacked by the Rot, are able to withstand it, and not be seriously injured. To encourage this work of finding out the best kind of potato, prizes have been offered at different times, and elaborate experiments, to test the varieties, have been carried out, without any very satisfactory results. But a great deal of good has grown out of this seeking for a disease-proof potato, especially in the way of improving the varieties through carefully selecting the tubers, and their proper cultivation. Knowing that the disease is a parasitic fungus (*Peronospora infestans*), the development of which is favored by warm, moist weather, and hindered by the opposite, there is little hope of finding a variety of potato that will differ so materially from all others, that it will be proof against the attacks of this fungus. There are, nevertheless, certain precautionary measures to be taken. These are embodied in brief, in an English review of Mr. Bravender's treatise, "The Potato Disease, and How To Prevent It," from which we take the following: "Secure good seed if you can, entirely free from disease. Plant early—on light land, 5 inches; on heavy land, 3 inches deep—and earth up well. Have the rows from 2 feet 8 inches to 3 feet apart in gardens, and 3 feet or more in the field for late varieties; may be rather less for others. If there is danger of frost, cover along the rows with short litter, about enough to hide the plants from view. Plant, if possible, in land not occupied by the same crop the previous year; and plant the late kinds, if possible, in a field by themselves. Use medium size sets, or cut sets if large, about 12 to 18 inches apart in the row, according to size. If the sets are very small, they need not be so far apart. Manure in autumn, and use potash salts or bone phosphate in the spring; or else make a compost of manure and earth, ashes, etc. Earth up twice. The tops may be cut off those required for seed, if the tubers are large enough. Harvest late kinds sooner than is usually done. If there appears any disease amongst the crop, sorting over will be required. If you have the convenience, store your crop for a time, and not put in pits until November. On harvesting, separate the diseased from the healthy ones." We have more or less of the Potato Rot in this country, sometimes to the destruction, whole or partial, of the crop, and the above rules may properly be observed by American farmers. The direction given to "earth up twice," is not needed with us, while in the moist climate of Britain, the crop is benefited by "hilling," the conditions are quite different with us, and unless in a very wet summer, flat culture gives better returns. While the potato crop is an important one with us, its failure does not bring such consequences to our farmers, as it does to the Irish peasant, whose life, and that of his family, may be said to almost depend upon the success of their all important potato crop.

Breeding Thorough-bred Stock.—As we were a short time ago looking over a fine herd of thorough-bred stock, upon a farm which we visited, while we did not covet it, we thought that no one, as he looked over these finely proportoned animals, could refrain from wishing to have a similar herd for himself. There is a charm in the whole matter of stock-breeding, and especially so if one has fine animals at the start, and their best points are made more fixed and prominent as the generations pass. But while looking at these animals and listening to the explanation of this and that point of excellence, the thought naturally suggested itself: is not this breeding of pure-bloods with the care and nicety, here manifest, a sort of fancy farming that only a few can hope to indulge in? What capital is invested! A thousand or fifteen hundred dollars, which in the breeder's view is not much, for a cow, is far beyond the ability of the average farmer. In order to succeed as a good breeder of thorough-bred stock, the first requisite seems to be a good bank account, and the second a clear idea of what one is breeding for—an end towards which all his skill—for he must be skillful—must tend. The proportion of men having the requisites for breeders of thoroughbred stock is small; and any one who contemplates the task should at the outset be sure that he possesses them. We would not discourage any one from undertaking the rearing of a herd of pure-blooded animals; but simply caution against going into it without a thorough preparation for the task. It is only when entered into intelligently and with the requisite capital that it is made to pay—and even then it can be remunerative only after some years of constant outgo with no corresponding income. The breeding of pure-bred animals is one of the most important departments of agriculture, for upon the existence and growth of such herds does the improvement of farm stock in general largely depend. If all our pure blood animals were taken from us, or rather, if they were scattered broadcast over the country, the work of centuries would be undone, but so long as these animals are kept in herds, with a judicious outflow of the pure blood to be mingled with the common stock of the country, they contribute largely to the general good by gradually advancing the average grade of our farm animals. It is well that there are men of sufficient means, combined with a love for improved live stock, who will keep herds of thoroughbreds, for they can be kept pure only with great care and often at great expense. Whatever may be their motives in building up fine herds, such persons can not well avoid being public benefactors, and we are glad to believe that there are some sufficiently public-spirited who do it mainly because it will conduce to the general good.

Nuts and Nubbins.

There are no sweets in family jars.

The mother of vinegar is very sharp.

Widows and widowers to be repaired.

The road to matrimony is a bridal path.

Gin Sling, a Chinese, is preparing for the bar.

Organ-grinders have a strong "turn" for music.

Could not the doctor's fee be justly called ill-gotten gains?

The way to get over a culinary difficulty is to go to Bridget.

It is the man with the rheumatism who is every inch a king.

Among birds the rooster is an early riser, and then comes the crow.

A woodcutter never fells a tree against its will. He always axes it first.

Too much of a good thing, as the kitten said when it fell into the milk pail.

A Utah wedding paragraph says "the bride was togged out in white gauze."

A hypocrite is a man who tries to be pious but can't, with a preponderance of cant.

Temperance reformers should turn their attention to money—it is always tight.

It's a very curious thing that the Nihilists haven't tried a kerosene lamp on the Czar.

Why is the vowel "o" the only one sounded? Because all the others are inaudible.

When Paul Boynton is married and settled, things will not go on so swimmingly with him.

Mrs. Partington says Ike has bought a horse so spiritous that it always goes off on a decanter.

If we could see others as we see ourselves, there would be more good-looking people in the world.

Lampton thinks "the man who whitewashes ceilings is in a sublime business." This is a kiln-joke.

"After all," said the baker, as he left an astronomical lecture, "after all, the world is only a big turn-over."

Many a young man who sows his wild oats, trusts to the grasshopper of forgetfulness to destroy the crop.

The discovery of diamond-making seems something like Edison's light; now you see it, and now you don't.

"If a man calls you a fool, pass him by," says the Persian philosopher; that is, leave him lying on the ground.

"Young man, invest your capital in integrity." It is quite impossible. There is really none in the market.

"I say, my little son, where does the right hand road go?" "Don't know sir; 'taint been nowhere since we lived here."

A poet says: "Oh, she was fair, but sorrow left traces there." What became of the rest of the harness he don't state.

Scene: Recitation in Mental Science. Professor—"How do you know that you know anything?" Senior—"I don't know."

Tell me what is an average? Child—A thing to lay eggs on. Mother says our old hen lays six eggs a week on an average.

"Sekretz, is a bad investment—if you pass it you loze the principal, and if you keep it you loze the interest."—Josh Billings.

How is it that trees can put on a new dress without opening their trunks? Because they leave out their summer clothing.

The post mortem examination of a man's life always reveals finer traits of character than he was ever before known to possess.

When you can hardly say enough for a man, say he is one of a thousand. It will be true as long as there are 999 other men in the world.

The seal probably puts up with more insults and abuse than any other animal. He is known the world over as a furbearing animal.

A child being asked what were the three great feasts of the Jews, promptly and not unnaturally replied: "Breakfast, dinner, and supper."

A mule's head does not contain a brain capable of culture and refined rearing, but it is wonderful to what an extent the other end can be reared.

An Indianian said to a young man who chaffed him upon his bald head: "Young man, when my head gets as soft as yours I can raise hair to sell."

It is a great piece of folly for a man to be always ready to meet trouble half way. If he would put all the journey on trouble, he might never meet it at all.

Patrick having been told that Dr. Peters had found an asteroid, remarked: "Bedad, he may have his asteroid, but as for meself ol prefer a horse ter ride."

"Will you name the bones of the head?" said a teacher to one of his class.—"I've got 'em all in my head, teacher," replied the pupil, "but I can't give 'em."

A Minnesota farmer who has five grown up daughters, has sued the county on a claim that his residence has been used as a "Court-house" for the past two years.

"If Jones undertakes to pull my ears," said a loud-mouthed fellow on a street corner, "he will just have his hands full." The crowd looked at the man's ears and laughed.

This is the way the married editor sums up Lent: "The hen which lays the Easter egg is a great bird, but it takes the goose which lays the golden egg to bring Easter bonnets."

If Noah had foreseen the future, and killed the two mosquitoes which took refuge in the ark, he would have rendered some of the strongest words in the English language unnecessary.

A little girl read a composition before the minister. The subject was, "A Cow." She weaved in this complimentary sentence: "The cow is the most useful animal in the world except religion."

"That is what I call a finished sermon," said a lady to her husband, as they wended their way from church.—"Yes," was the reply with a yawn, "but, do you know, I thought it never would be."

Newly married husband: "This is a friend of mine, my dear—a friend of twenty years' standing."—His bride: "Good gracious. Then pray give him a seat, for I am sure he must be tired."

Dr. Charles Smart of the army is looking scientifically into the well and cistern water of New Orleans, to ascertain what the people of that city drink. We fear the doctor is on the wrong scent.

The Cleveland "Herald" advises Christians to hire a steamboat, give a Sunday excursion, and then suddenly open religious services on the crowd of loafers. They must either listen or jump overboard.

"Do you use many flowers on your table?" asked Mrs. Murray Hill of a southern visitor.—"Well, yes," was the reply; "we have wheat and rye bread for breakfast, but the old man will stick to corn dodgers.

A school boy being asked by his teacher how he should

flog him, replied, "If you please, sir, I should like to have it on the Italian system of penmanship—the heavy strokes upward, and the downward ones light."

Kankakee has a justice who beats them all in the way of doing up a job of matrimonial splicing with neatness and despatch. This is his formula: "Have 'er? '—"Yes."—"Have 'im?"—"Yes."—"Married; $2."

"What a beautiful sight!" exclaimed Mrs. Jones rapturously, as she looked out over the beautiful scenery from a Pennsylvania railroad car.—"Yes," replied Jones, without raising his eyes from his paper, "anthracite."

A married man bought a spring chicken in the market the other morning, and now he thinks the reason it was called spring chicken is because it will take him till next spring to carve it, unless he uses nitro-glycerine.

"Man," says Victor Hugo, "was the conundrum of the eighteenth century; woman is the conundrum of the nineteenth century." An American editor adds: "We can't guess her, but will never give her up—no, never!"

"What's in a name?" Ah, William, you didn't know everything, that's certain. Salt can be bought for a few cents a quart, but call it Chloride of Sodium, and the apothecary will charge you half a dollar for one scruple.

The sporting season has arrived, when the amateur hunter goes into the forest and shoots the farmer's $10 cow, under the impression that it is a deer, and afterward pays the farmer $25 to settle the matter and keep it quiet.

The enemies of the Czar of Russia will attempt shooting him, blowing him up and stabbing him, and still he will live until some day, when he is fooling with a revolver that isn't loaded, he'll get the whole top of his head blown off.

A senior, after vainly trying to explain some scientific theory to his fair inamorata, said: "The question is difficult, and I don't see what I can do to make it clearer?"—"Suppose you pop it?" whispered the blushing damsel.

Lives of grocerymen remind us
They can make their starch half lime,
And with sugar wholly blind us,
Putting sand in all the time.

"Why, you'd better knock the door down. What do you want?"—"Och, my darling! don't let me wake any of your family. I'm just using you knocker to wake the people next door. I'm locked out, dye see, and they've niver a knocker."

Little Rhode Island is sensible enough to pass a law against pigeon shooting.—[*New Orleans Picayune.*] H'm, yes. The shot used to scatter into other States so badly that Connecticut and Massachusetts chickens were in danger.—[*New Haven Register.*]

A lecturer was explaining to a little girl how a lobster cast his shell when he had outgrown it. Said he, "What do you do when you have outgrown your clothes? You cast them aside, do you not?"—"Oh, no," replied the little one, "we let out the tucks."

A native of the Green Isle was pressed by the collector of a water company for payment of the water rate; to which modest request he returned the following answer: "Sure I pay tin shillings a year for wather, and many's the day it's off for a whole wake!"

"Is this my train?" asked a traveller at the Kansas Pacific depot, of a lounger.—"I don't know, but I guess not," was the doubtful reply. "I see its got the name of the railroad company on the side, and I expect it belongs to them. Have you lost a train anywhere?"

Mother (at tea-table): "Jack, who helped you to those three tarts?"—Jack (age seven): "The Lord."—Mother: "The Lord? Why, what do you mean, Jack?"—Jack: "Well, I helped myself, but father said yesterday that the Lord helps those who help themselves."

He was a very stubborn little five-year-old boy. The boy's mother determined to conquer him, and, having administered a severe chastisement, she said: "Will you mind now, Johnny?"—With sobs and cries he replied: "Yes, mamma, I will, but I hate to, awfully."

We frequently hear a lady exclaim, "Oh, dear! I wish I were a man!" but we do not remember ever hearing a man wish himself a woman. No; man never dared allow his wishes so so..r so high. He is content to admire rather than be the thing admired. N. B.—This is not taffy.

A little girl passing the Washington Statue, lately, asked a lady who was with her if Washington was buried there. "No," said the lady.—"Where is he buried?" said the little girl.—"I don't know," said the lady.—"Then I guess you don't read your Bible much," said little innocence.

A Tennessee man accidentally shot a dog, and in trying to explain to the owner how it occurred accidentally shot him. A coroner thought he ought to explain how he shot the man, but couldn't get a jury that was willing to listen to the explanation; they were kind of shy of him, as it were.

"Have you any objects of interest in the vicinity?" the tourist asked the Burlington man.—"I have, I have," eagerly replied the other, "but I can't get at it to show it to you. It's a ninety days' note and its down in the bank now, drawing interest like a horse race or a mustard plaster."

"Papa," said he, as he was shown some pictures in a book Santa Claus had left him, "Papa, why does camels have such big hunches on their backs?" The information received not being very satisfactory, he at length solved the difficulty himself. "Why, I know, papa," said he, "it's so's they'll be camels."

Grammar!—Invalid: I've had a wretched night, Mrs. Wobbles.—Nurse: Dear, dear me, sir, I thought you slep' most comfortable.—Invalid (with a groan): Oh, Mrs. Wobbles, do use the adverb.—Nurse: Yes, sir; I'll see about it directly, sir, but—(puzzled)—I reely don't think there's one in the 'ouse, sir!

A little boy being asked by another boy what he was doing now, replied, "I am cashier in a clothing store."—"You, cashier!" said the other in amazement.—"Yes," said the little chap, "that's what the clerks call me. A hundred times a day they holler 'cashier.'" "Cash! here!" was what the clerks said.

Tradesman to country customer who has come to complain of the quality of his matches: "Not light? Why, I have only to draw them smartly across my cord breeches, and they blaze instantly."—Customer: "Yes, but what's that to me? I can't come a matter of four mile for your old breeches every time we wants a light."

Pat: "Well, Dan, and have ye heard the news—have ye heard that Rory the miller's dead?"—Dan: "Rory the miller is it that's dead now? but ye don't say so, and he was a young man too."—Pat: "Faith, an' that's thrue for ye, Dan; he was such a young man, now, that I expected to see him at my own funeral instead of me going to his."

"Where is your mother!" said a worthy man to a little street miscreable. She answered diffidently, "She is dead."—"Have you no father?"—"Yes, sir; but he is sick."—What ails him?" continued the questioner.—"He has got a sore finger sir."—"Indeed?"—"Yes, sir."—"Why don't he cut it off, then?"—"Please, sir, he hain't got any money to buy a knife."

An original thinker never thinks the things that other people think.—*New Orleans "Picayune."* But when one thinks that another is thinking things that no other could think, and he thinks he will try to outdo him by thinking greater thinks than he thinks the other is thinking, we think he is about as foolish as we are in thinking of this thing at all.—Boston "*Advertiser.*"

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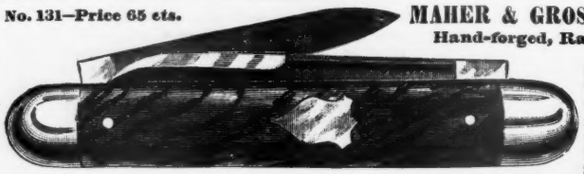

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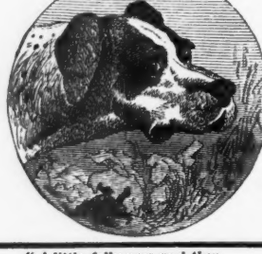

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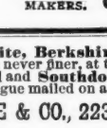

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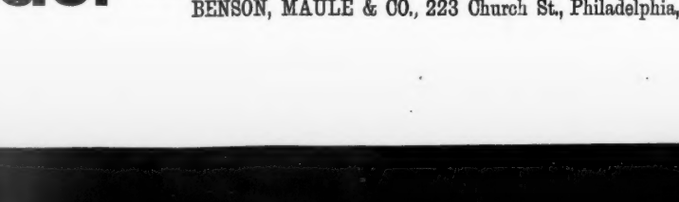
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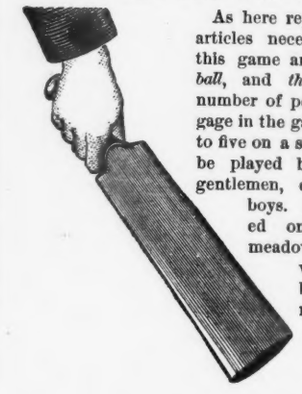

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